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I.C.I. MAGAZINE

A. W. Baldwin

Cyril Child

David Lessels

John Rose

James Taylor

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Contributors

A. W. Baldwin, who contributes the second in our series of articles on retirement, was Associate Research Manager of Dyestuffs Division in charge of researches in the field of colour photography. He retired in 1960, most of his 38 years with ICI having been spent on research apart from a spell as Division Publicity Manager from 1943 to 1948. Dr. Baldwin has had several articles published previously in the *Magazine*.

Leslie Cannon is the Education Officer at the Electrical Trades Union Residential College at Esher. Originating from Wigan, he joined the Union in 1936. Since that time he has held numerous offices in the Union, serving as District Secretary and on the Area Committee. He was elected an Executive Councillor, and has represented the Union on most of the negotiating committees with which it is associated. During the period 1946–54 he was one of the ETU's national representatives on negotiations with ICI.

Cyril Child is Head of Information Services at Plastics Division, a post he has held since 1946. He joined ICI in the Rubber Service Laboratory of Dyestuffs Division in 1939 and has served in Northern Region Sales and Plastics Division Export Departments. In his capacity as Head of Information Services he has gained wide experience as a technical author and lecturer and has broadcast in English and French and appeared several times on television. He is a member of the Council and Chairman of the Education Committee of the Plastics Institute.

David Lessels is a member of the Technical Service Department of Paints Division, which he joined in 1958. Before that he spent five years trekking round Africa, during which time he climbed Kilimanjaro, about which he writes on page 69. During his travels round Africa he earned his living "at a variety of interesting jobs, including elephant hunting, crocodile shooting, mica mining and gold prospecting." His hobbies are writing and judo.

John Rose is a Joint Managing Director of the Paints Division and Chairman of the Withins Paper Staining Co., the Division's wallpaper manufacturing subsidiary. He joined the British Dyestuffs Corporation, the forerunner of Dyestuffs Division, in 1935 as a research chemist. He was appointed Research Director of Dyestuffs Division in 1951, Production Director in 1958, and Joint Managing Director of Paints Division in 1959.

James Taylor has been a regular contributor to the *Magazine* over the past years. Originally a physicist in Nobel Division, he is now the ICI Director responsible for metal interests and is Chairman of Yorkshire Imperial Metals Ltd., Imperial Aluminium Co. Ltd. and Imperial Metal Industries Ltd.

Cover

Decorative tile from Braga. (See "Portuguese Phrase Book," by James Taylor)

The ICI Magazine, price fourpence, is published every other month. It is designed and printed by The Kynoch Press, Birmingham, and published by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London S.W.1 (VICtoria 4444). The editor is glad to consider articles and photographs for publication, and payment will be made for those accepted.

When The Editor Regrets

The *Magazine*, as its readers must be well aware, depends almost entirely on members of the Company for its articles and stories. This is true also of the majority of the photographs which are published, although here and there the work of a professional photographer may be featured and professional artists are used fairly frequently as illustrators.

The serious purpose of the *Magazine* is, of course, to present a record of the Company's activities and to keep readers informed concerning its achievements, also to offer explanation, where occasion presents itself, of Company policies and objectives. On the lighter side, the *Magazine* strives to afford a friendly and informal platform for the display of individual talent and experience. Not surprisingly, spontaneous contributions submitted to the *Magazine* tend to be rather more in favour of the personal than the Company side of the business. Yet the balance between the serious and what without disparagement may be called the frivolous content of the *Magazine* must necessarily be weighted predominantly in favour of the former. It follows that only a proportion of the contributions submitted can be published.

To save disappointment to readers who may be thinking of submitting photographs or stories it may be helpful, therefore, to set out what are the guiding considerations of the *Magazine* in the matter of selection. To take photographs first, it is policy to reserve the front cover for a picture directly linked to some feature within the *Magazine*, for which it affords an illustration. This means that there is space only on the back cover for the isolated picture standing on its own pictorial merits and unconnected with any interior feature. Opportunity for this type of picture is therefore obviously restricted. To qualify for publication it must possess considerable pictorial merit, evidence originality of subject and, above all, be of sufficient firmness and colour intensity for its essential quality to survive the sobering processes of reproduction. Not many, it must be admitted, of the normal run of holiday snapshots manage to fulfil these requirements. But, of course, a number will, and these will always be welcome. Quality of negative and originality of subject are the deciding factors.

When it comes to literary composition, the case is not dissimilar. Space is necessarily restricted, and the basis of selection must be one of sheer interest. Can "interest" be defined? Probably not, because it is of its very nature—and hence the skill of authorship—that it defies all rules and triumphs in its own despite. To be interesting an experience need not, in skilled hands, be either strange, "exciting," or necessarily even original. But in less skilled hands it is probably safe to say that it has to be all three.

As a general guide the *Magazine* does not normally accept purely fictional contributions. The short story is well catered for by a host of outside publications. Readers, it is felt, of a company magazine prefer to read of the real-life experiences of their fellow workers, and these experiences should be either unusual in themselves or rendered so by the circumstances in which they came about. And humour? Humour is very rarely humorous except when it is a means to an end and not an end in itself. And verse? Ah, in the case of verse it has to be admitted that an editor's regrets are nearly always more diplomatic than genuine.

A Pattern for Wallpapers

Through the Withins Paper Staining Co. Ltd., a subsidiary company which is operated by Paints Division, ICI has for almost two years been manufacturing wallpapers at mills at Radcliffe and Rochdale in Lancashire. Additionally, about £2 million is being spent on re-equipping the Orb Mill, a former cotton mill near Oldham, to produce an additional twelve million rolls of wallpaper a year. The Company's reasons for entering the wallpaper field, and its plans for the future, are discussed here with Mr. John Rose, Joint Managing Director of Paints Division and Chairman of Withins.

Editor: The big question which many people in the Company are still asking is "Why did ICI decide to go into the wallpaper business?"

Rose: I think the logic and reasoning behind it went something like this. Paints Division's prosperity, particularly over the last ten years, has been largely linked with the decorative paint market, and an important part of that is the retail market which supplies 'Dulux' Gloss, Emulsion, etc., for house decoration. At one time we even thought that paint, particularly emulsion, was ousting wallpaper in room decoration. But in the late fifties it became clear that more and more people were using wallpaper, either alone or in complement with paint, in redecorating their homes. Hence we decided that we should be able to offer both wallpaper and paint to the home decorator.

Editor: That explains the reasons behind the decision. Having taken it, how did you go about entering a field which was quite different from anything the Division had done in the past?

Rose: After a lot of discussion, which involved such things as consideration of "green field sites" and "going it alone," we decided we had to buy our knowhow, and the way to do it was to buy the best available company outside "The Combine" (the name by which Wallpaper Manufacturers Ltd. are known in the industry). This was the Withins Paper Staining Co. Ltd. of Radcliffe, Lancs, which had a good reputation in the trade, and the directors of which were well known to us. After negotiations, which were marked by great friendliness and co-operation, the whole of the share capital was purchased in 1960. Shortly afterwards we learned that a similar sized mill, the Rochdale Wallpaper Printing Co., at Smallbridge near Rochdale, was available, and we bought that too. This doubled the capacity. The Rochdale company was subsequently liquidated and its assets were bought by Withins—which is the legal way of saying that the two companies were amalgamated under the original Withins name.

Editor: How soon do you expect to be producing at Oldham, and by how much will production there increase your total output?

Rose: We would expect some trial production from the Orb mill at Oldham in the autumn of 1964, building up to something like full production in 1965. Eventually this mill should make about 12 million rolls (or pieces, as they are called in the trade) per year, which is about twice as much as the annual capacity of the two existing mills.

Editor: How big a share of the market do you eventually hope for?

Rose: I've no intention of trying to answer that one specifically. After all, when is "eventually"? However, when we sell all the output of all three mills we expect this to be 10–12% of the total UK market.

Editor: If you are to extend your sales to such an extent you presumably have plans for selling in new areas. Where are you planning to sell?

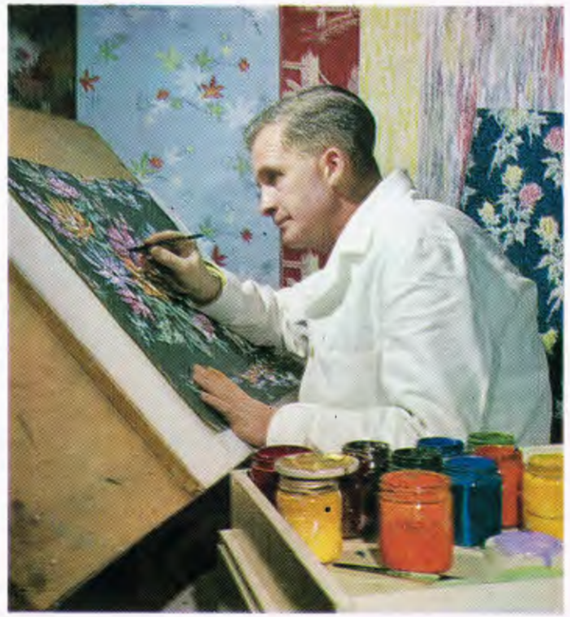
Rose: At present we sell chiefly in Yorkshire and Lancashire, with a few isolated outposts in Scotland and London. Clearly we shall have to widen the area of distribution and eventually cover the whole country. It is also intended to undertake limited export operations, initially in countries in which we have associated paint companies who have thriving businesses in decorative paints.

Editor: How about prices? There seems to be a wide range, and I wonder which part of the market you are aiming for.

Rose: Our sales at the moment are largely in the lower and middle parts of the price spectrum, and we hope to extend these towards the top end. We have no plans at the moment for the very expensive hand-painted papers, some of which are so dear that they are sold by the yard instead of the roll.

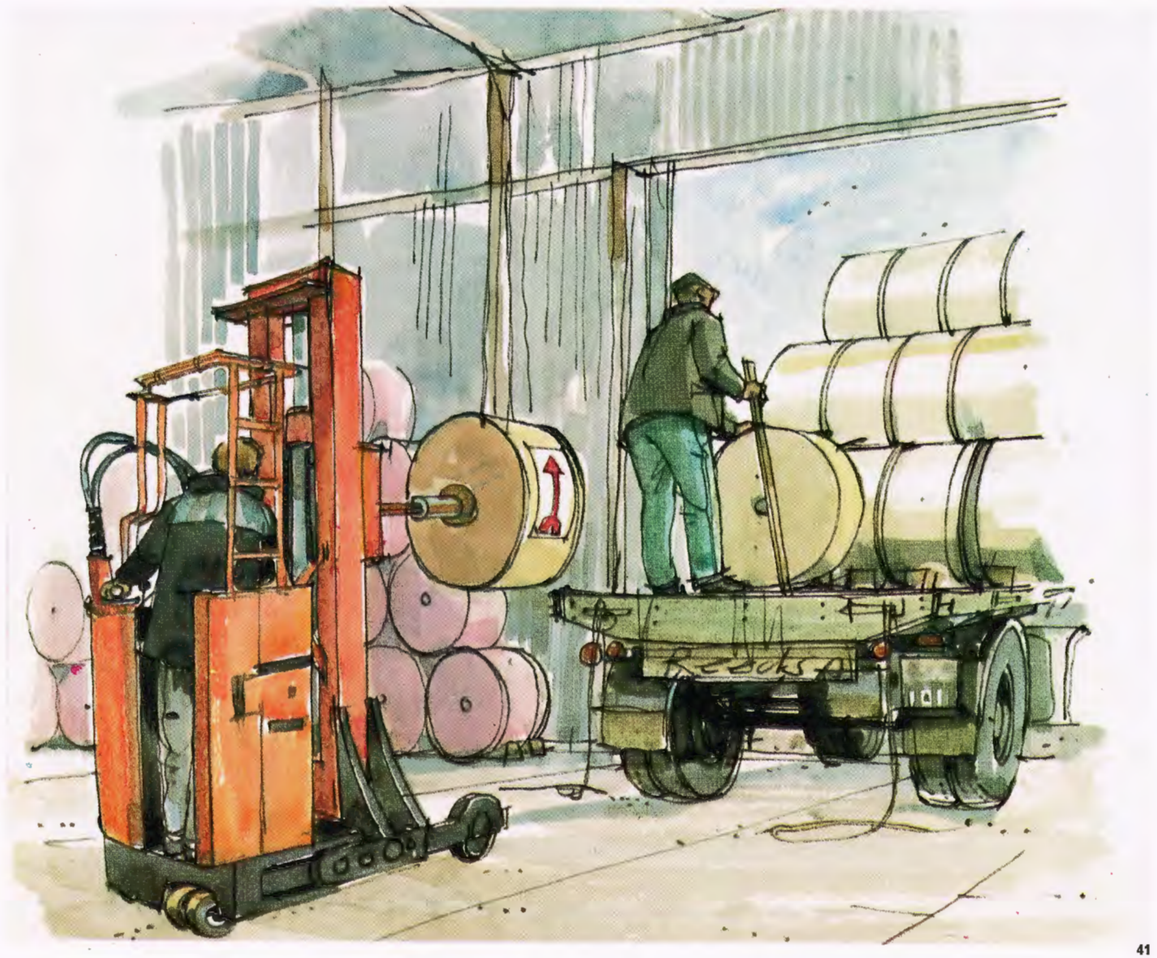
Editor: Many of the shops which deal only in paints and wallpapers are owned by the manufacturers. Is there any possibility of ICI moving into the retail trade in the same way?

TOP: *Norman Walmsley, one of Withins' own wallpaper designers, at work at the Roach Vale Mill.* BOTTOM: *The use of a modified reach-lift truck for moving heavy reels of paper has been developed by Withins. The twin forks usually fitted to this type of truck have been replaced by a single arm which fits into the cen.re of the reels*



Rose: It is true that a great many shops are owned by Wallpaper Manufacturers Ltd. These are usually called "Crown Wallpapers" or "Brighter Homes," but there is a far greater number which are independently owned. Many of these, of course, sell our competitors' papers, but we know they would like to sell ours too, and we believe that they will provide us with very adequate outlets. We have no plans to make ICI a nation of shopkeepers, and our experience with 'Dulux' shows that we can sell successfully through other people's shops.

Editor: ICI (Hyde) Ltd., another subsidiary company which is operated by Paints Division, is now selling 'Vymura' as a new



LEFT: *This impressive 12-colour wallpaper printing machine is one of several at Withins' Roach Vale Mill, near Rochdale.* BOTTOM: *Real craftsmanship in both wood and metal is required of the man who prepares the rollers from which the wallpaper patterns are printed*

wall-covering material. Does this mean that Withins and Hyde are in direct competition?

Rose: No, there is no competition whatever between Hyde's 'Vymura' and Withins wallpapers. 'Vymura' is a wall-covering of polyvinyl chloride coated on a paper base and printed in various decorative patterns. It is far tougher and harder wearing than any orthodox wallpaper, and it is expected initially to find its outlets in so-called "specification work," chiefly in public buildings. Eventually, when 'Vymura' finds its way into the retail market, it will be complementary to our wallpapers rather than in competition with them.

Editor: Does this decision to expand wallpaper production affect any other Divisions of ICI—perhaps as suppliers of raw materials?

Rose: No, this will have very little effect on other Divisions. By far the most important raw material is base paper, which ICI does not make. Other materials, such as pigments made by Dyestuffs Division, or polyvinyl acetate made by Paints and Dyestuffs, are used in quantities which are small compared with other users. But the knowledge of pigments and coating compositions in general which the Company has should be very useful to us in improving the quality of our products.

Trends in Plastics

Cyril Child

It is appropriate that the *Magazine* should review the plastics industry just now because June 1962–May 1963 is being celebrated by the plastics industry as its centenary year.

The birth of an industry is not a single, unique event which can be pinpointed to an hour, a day, a month, or even a year. Rather is it the result of a loose fusion of trends of social, economic and military pressures, trends of scientific investigations, and more or less accidental discoveries and inventions – all stretching over several years. But often one particular event is seen, in retrospect, to stand out above all the others and to have been, as it were, the focus round which all the other developments which went on fell into place. So it was with the plastics industry.

From about 1830 interest was quickening all over the world in science and in what today we call technology. Germany, France, Britain and America all contributed to this growing flood of experiment, discovery, invention, new knowledge and new industry. In particular, German and French scientists studied the action of nitric acid on woodpulp and cotton – that is, cellulose. The inflammable and explosive nature of the product—cellulose nitrate—was discovered; it was found that solutions of it evaporated to leave behind clear films; in the solid mass it was found to be tough and horny, and malleable when heated. It was in fact being slowly realised that here was something that was very nearly, but not quite, an excitingly useful material – it still needed some modification to make it really useful and versatile.

Alexander Parkes, a Birmingham metallurgist, worked with it, on and off, for many years and, in as nearly as we can tell 1862, he added camphor to it, and so made that final modification. This is what we are celebrating 100 years later, for it was this event which now stands out so clearly as being the crucial one – the culmination of years of research scattered throughout Europe. Parkes had produced the first man-made plastic.

The early development of the plastics industry stems from the success of Parkes' invention, which became a household word under the American trade name 'Celluloid,' and from repeated attempts to make similar materials with all its good properties but without its limitations. The early growth was slow; in the early years of this century it was hastened by the work of the brilliant Belgian, Baekeland, which led to the production of phenol formaldehyde, an entirely new type of plastic, later famous as 'Bakelite'; the rate increased somewhat in the 1920s, and really accelerated in the 1930s. The second world war firmly established the industry everywhere as a major one, and since the war it has, in Britain, grown faster than any other except perhaps pharmaceuticals.

As We Are

Before looking to the likely developments which will lead the industry to the horizon of its future it is necessary to know just where it stands now.

The chart gives a picture of the industry, in this country and overseas, in terms of tons. In Great Britain alone the output amounts to some 650,000 tons a year (one-fortieth the weight, but one-seventh the volume of the annual British output of iron and steel), worth about £150,000,000, of which about one-third is exported directly.

Plastics Production '000 Metric Tons

	1956	1957	1958	1959	1960	1961	1962
USA	1,660	1,800	1,910	2,500	2,850	3,120	3,300
W. Germany	469	564	629	779	965	1,016	1,200
France	130	163	232	271	350	384	*410*
Italy	116	134	168	220	300	422	500
Japan	243	301	314	506	550	675	*850*
Britain	355	400	423	507	570	610	650

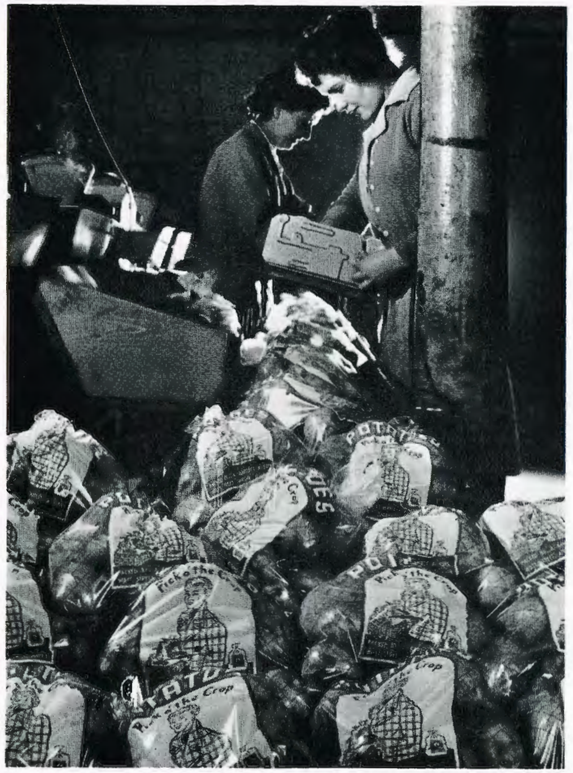
Figures calculated from official sources. *The figures in italic are estimated.*

Five groups of materials dominate the scene everywhere – polythene, PVC and polystyrene, which are all thermoplastics, and phenolic and urea resins and powders, which are thermosetting materials. In addition there are perhaps another fifteen types in commercial production, the most important being acrylics, nylons, fluorine-containing plastics, polypropylene, silicones, polyurethanes, polyformaldehydes, melamines, and reinforced plastics based on polyesters or on epoxies.

Each of these materials is available in many grades and formulations, and some are made in different physical forms such as liquids, lumpy solids, powders, granules, sheets, films, rods and tubes. Some are used as virtually pure materials, some have many different materials compounded with them to modify their properties (including their prices) – additives such as plasticisers, extenders, fillers, heat stabilisers, light stabilisers, antistatic agents, antioxidants and pigments.

Some grades show subtle differences of physical forms such as different particle shapes or particle size distribution.

Each material, each grade, each formulation has its own unique combination of properties, making it specially suitable for a particular application and a particular process; each variation, gross or subtle, has its purpose in so modifying the properties as to extend and widen the range of usefulness of a basic chemical type of plastic.



TOP: *Potatoes being pre-packed in multi-coloured printed 'Queensway' polythene bags made by British Visqueen Ltd. at Stevenage.* BOTTOM: *A reinforced plastic door being fitted to a carriage for British Railways. (Photograph by courtesy of British Resin Products Ltd.)*

To support this enormous and varied output and usage of plastics the chemical and engineering industries have developed specialised branches. To transform a powder, a liquid or a sheet (or any other raw material form) into a finished article requires machinery to heat the material, apply pressure to it, and finally cool it. At first existing equipment such as that for handling rubber or metals was used, but as refinement of demand led to the production of special materials it was realised that full benefit could be obtained from them only by refinement of the machinery. As a result there has grown up an important and active branch of mechanical engineering concerned with the development of new and improved machinery for handling plastics. Finally there are the converters – some very large, some of middling size, some very small – who buy the raw plastics materials and shape them, by means of the special machinery, into the thousands of articles of industry and commerce. Every industry uses plastics in many ways, and every year each industry uses more and more in more and more different ways.

This then is the plastics industry after 100 years – virile, growing and very varied.

Tomorrow

To forecast accurately the future of an industry is as difficult to make as any other kind of forecast. If the forecaster is aware of the trends and pressures around him he can see a little way ahead with some confidence, but after that it's anyone's guess. What then are the trends and pressures of today which will, almost certainly, shape the next ten years of the plastics industry?

First of all, there is no sign that, within this time, the demand for plastics will stop rising. The materials we know today are readily accepted by design engineers, and every day not only brings repeat orders for existing uses but new business for new uses. Most of these new ones are obvious developments, based on logical extensions of existing applications or on analogy with previous ones. Thus building, and transport by road, rail and sea are particular fields where more and more of the plastics of today will be used. The "all-plastics" car or the "all-plastics" house may have to await the discovery of as yet undreamed-of polymers, but in the next ten years we may hope to see several times as much plastics used in making every car and house as is used today. Take building, for example.

Without departing very far from traditional concepts and methods of building, a formidable list of accepted applications of plastics in houses, shops, schools, hospitals and factories can be made out – though at present, for various reasons, probably no finished building incorporates plastics in every application where they could have been used.

The list might start at the top of the outside of a building, and would include acrylic domelights (double-skinned in cold climates), corrugated acrylic rooflights, rigid PVC ventilators, plasticised PVC roof coverings. Moving down, still on the outside, there would be rigid PVC guttering, downpipes and soil pipes; laminated (perhaps rigid PVC surfaced) infill panels; rigid or flexible PVC coverings on window frames, with nylon catches on the windows. Inside the house the list would show PVC flooring and all sorts of plastic or plastic covered wall cladding and partitioning; acrylic lighting fittings; rigid PVC curtain rails and nylon runners; acrylic sinks; acrylic handbasins, baths and shower cabinets (perhaps in a prefabricated bathroom, installed as a single unit); plastic covered electric cables in plastic conduits, with plastic insulated plugs, sockets and switches; rigid PVC water mains feeding polythene distribution pipes and an all-polypropylene low-level cistern. And all these uses, and many others too, have been proved to be sound and are accepted by many architects and local government authorities. In addition, there are scores of tests going on, all over the world, which if successful will make the list much longer.

Turn for contrast to the sea. Here not only will more and more plastics be used in the construction of boats and ships, but in the ancillary gear. For example, yesterday there was the nylon fishing line; today there are trawl nets of nylon, of polythene or of 'Terylene'; tomorrow . . .?

In the air, planes, rockets and missiles are the products of adventurous new technologies and already use great quantities of plastics and perhaps cannot use more until the undreamed-of materials, with very different properties, become available.

Back on the land, farmers throughout the world are becoming interested in plastic films and sheets, and perhaps all that is wanted to turn this interest into a great flood of demand is development of new techniques for using these sheets and films in huge areas. Israel has perhaps provided a clue to the new technologies which the farmer will have to learn by installing extruders to make plastic films on the farm where they are to be used.

This, then, is fairly certain – the production and usage of existing types of plastics will increase, and this increase will be accompanied by increased diversification of grades and by increased numbers of applications.

Secondly, the greater acceptance of plastics by design engineers, the availability of the newer and stiffer plastics, and the availability of bigger processing machinery are already leading to the production of bigger articles made of plastics. No longer are plastics restricted to use in small articles and components weighing at most a few ounces. Storage tanks and containers to hold thousands of gallons; domestic equipment such as washing-machine housings; boats 20 ft. long – these can all be made in a single quick operation.

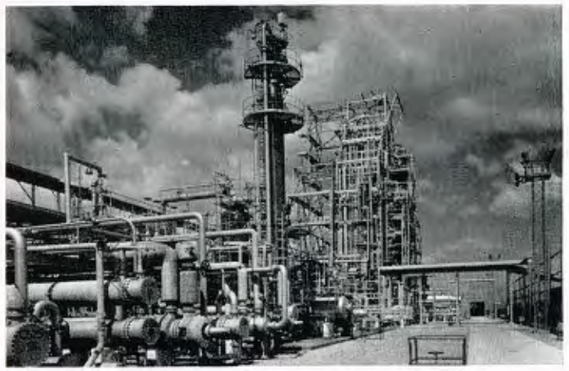
Here, then, is the second major line of certain development – increase of size of plastics goods utilising the materials we know today.

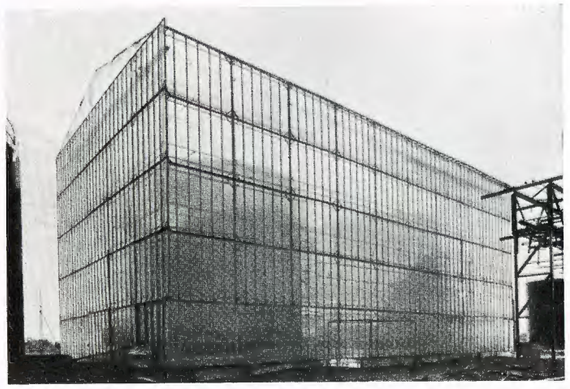
Thirdly, there is the development of other new technologies to be considered. Sometimes a new idea is born but cannot be developed at the time because materials with the necessary properties are not available, and this creates a pressure on research workers and inventors to try to produce them.

On the other hand, the availability of a material with a particular combination of properties sometimes sparks off a new train of thought in some inventor's mind and leads to a new industry. It is going too far to claim that this has been true of the packaging industry, but without doubt the availability of plastics which are transparent or translucent, which are tough and non-splintering, which can be colourful (for gaiety or identification), which are impermeable to water – or almost so – and do not corrode, which can be obtained as films, made into bags or moulded easily to shape – all this has given a great spur to packaging as a new industry. Dust covers and mothproof "wardrobes" made from polythene film or PVC sheet; motor cars transported across the tropics in polythene film bags; cosmetics and drinking water on yachts contained in polythene "bottles," prepacked, clean vegetables and fruit in polythene film bags or cunningly extruded "nets" – these are now familiar uses of plastics, yet only ten years or so ago not only did glass, metal and paper reign supreme in packaging, but they could not do some of these jobs so readily done by plastics.

Today more and more things are packed in a greater and greater variety of styles and sizes of packages than ever before. And we are only just at the beginning of what will surely become a major new technology throughout the world. Already we find the packaging expert dissatisfied with the combination of properties one material alone can offer him. For some time he has put polythene films on to backings of hessian and paper; now he is putting polythene on to regenerated cellulose, aluminium foil or polyester film ('Melinex'); or polyvinylidene chloride ('Viclan') on to cellulose or polyester film; or . . .? With each combination he gets more protection in some direction, and such is the variety of goods to be packed in the right material that we shall soon see innumerable combinations of plastics – apart from any new ones – becoming standard raw materials for this new industry.

In this consideration of the development of the plastics we already know we have treated them as materials used individually and each in its own right as possessing a unique set of desirable properties. There is, however, growing interest in a different kind of development which has already produced some important





FROM TOP TO BOTTOM: *The Heavy Organic Chemicals Division's No. 3 Olefine Plant at Wilton. 'Queensway' polythene liners for use in drums, cartons and sacks. 'Visqueen' building sheet covering a temporary scaffolding measuring 100 ft. × 50 ft. × 50 ft. over two aluminium oil storage tanks being built at Severnside as protection during argon welding work. The moulded, resin-bonded glassfibre body of this two-berth caravan is strong, will not rust, and can be self-coloured to minimise painting. (Photograph by courtesy of British Resin Products Ltd.)*

advances. Briefly, it is either the mixing of one polymer with others, sometimes called "blending," sometimes "alloying," or the combination in some way of a plastic with other kinds of materials, such as metals or glass fibres. Blending of two or more polymers often produces a mixture with properties which are basically the sum of those of the separate constituents of the blend, and this enables the designer to get the best of two worlds. Typically, the blending of a rubbery polymer with a more brittle one will often give a compound with most of the virtues of the brittle plastic but with greatly enhanced impact strength – a consideration of great importance in such uses of plastics as pipework, motorcars and telephones. This kind of development may yet yield some very interesting products, and so once again enlarge the scope of the applications for some plastics.

The use of plastics in conjunction with metals or other materials has only just begun. The simplest example is the coating of metal with a plastic in order to marry the strength and rigidity of the metal to the resistance to corrosion and the permanent decorative effect of the plastic. A rather more complicated case is the impregnation of porous metal – for example, for bearings – with PTFE in order to obtain the rigidity, dimensional stability and thermal conductivity of metal allied to the low frictional resistance of the plastic, and so eliminate the need for lubricants in textile and food-processing works, where one drop of oil could ruin hundreds of yards of fabric or hundreds of tins of soup.

Now we come to the realm of the "undreamed-of" – the materials not yet discovered. Can we say anything at all about them? Yes, to some extent we can, because although research is going on all over the world to try to discover new polymers, it is mostly concentrated in two main streams, the courses of which can be discerned, but inevitably the time-scale of this kind of development is completely unknown.

The first stream of this kind of research is aimed at producing plastics which are superior in some way to those we know today. The word "superior" needs some qualification, because a property that is a disadvantage in one application may be a great advantage in another – for example, the high insulation characteristics of polythene makes moulded polythene houseware liable to attract dust because static electricity may be developed on their surfaces, but these same insulation characteristics make polythene a first-class insulator for electric cables. "Superiority" must be judged in the context of an application.

There are two fields of application – mechanical engineering and civil engineering – where the plastics we know have made little headway because, in the context of these applications, plastics suffer from deficiencies. The mechanical and civil engineers consider that the major deficiencies of the plastics we know

already are of three kinds: firstly, all have low stiffness; secondly, none will stand long use at temperatures above 300°C; and thirdly, all are soft-surfaced – the hardest are only about as hard as aluminium. To this list we might add two more drawbacks of plastics, namely that most of them will burn at relatively low temperatures and that many do not stand up well to exposure out of doors. These, then, are the targets of this kind of research – plastics of improved stiffness, of greater heat resistance, of greater surface hardness, of lower inflammability and of improved weather resistance.

On theoretical grounds it is believed to be unlikely that any organic plastic (that is, one based on the element carbon, as are all the important ones used today) will be able to show more than a slight improvement in any of these directions, and attention is turning more and more to inorganic polymers based on elements such as phosphorus, nitrogen and metals. Of course, nothing is ever gained on the swings without a loss on the roundabouts, and inorganic polymers may scarcely be recognisable as plastics. If, for example, an inorganic polymer has very high heat resistance it will require something very different from normal plastics processing machinery to shape it.

Here, then, is a possible line of development – the discovery of materials of greater stiffness, of greater heat resistance, of greater hardness, and they may well be inorganic rather than "conventional" organic plastics.

The second broad stream of research arises from the fact that chemicals fall into classes, and if one member of a class is found to take part in a reaction that produces a polymer, it is logical to extend the investigation to neighbouring members of the class. Our modern understanding of the processes of formation of polymers, and of the relations between polymer structure and properties, provides us with some guides, so that it is not necessary to "try all the bottles on the shelf" – at least, in the first place.

On this basis we can be fairly certain that the next ten years or so will see a good deal of interest in the olefines – that is, in materials closely related to ethylene and propylene – and in mixtures of them.

Finally, there is the widely scattered research undertaken for all sorts of reasons and lying outside the two broad streams considered above – some of it, indeed, well outside normal plastics research, for example in biological work. No crystal ball exists to allow us even to make wild guesses at the possibilities here.

Plastics Overseas

Today many countries have a plastics raw material manufacturing industry and nearly all have a plastics fabricating industry, be it only small at the moment.

This raises the question of the future of exports. The first point to notice is that, although new raw material manufacturing capacity has sprung up all over the world each year since the war, our exports have gone on increasing – a reflection of the world demand for plastics, and, for the reasons discussed earlier, there is no reason to expect the world demand to stop increasing. There will, of course, be changes in the patterns of exports and imports as individual countries start their own raw material manufacture and reach positions of self-sufficiency or even surplus in the production of individual plastics or specific grades.

We may, however, expect to see a growth of one feature of what may be called "the export trade," taking the phrase in a wide sense. This is an invisible export, and it consists of selling patent rights and knowhow relating to the manufacture of plastics – as an example ICI has licensed many companies throughout the world to operate its high-pressure process for making low-density polythene. An important aspect of this kind of export is that it presents two challenges to research – one is to discover useful new materials, the other to establish the most efficient and profitable methods of manufacture so as on the one hand to remain competitive in world markets and, on the other, to have knowhow that others will envy – and therefore want.

An interesting development is the linking of the chemical and engineering industries in such transactions, with the engineering companies undertaking to design and erect a plant to be sold with the process and knowhow.

Overall, then, efficient raw materials manufacturers can look forward to continued growth of "sales" to other countries, though the pattern of business by any one producer may well change as time goes on.

No More than a Beginning

Enough has been said above to show the reasons why we in this industry, now 100 years young, look forward to the future with confidence and enthusiasm. Our present materials will, for a long time to come, be used in greatly increasing quantities; and, such is the scale of research effort everywhere, that we expect many more new and better materials to come along. Indeed, the first 100 years is surely no more than a beginning.

The Signatory Trade Unions: The E.T.U. | *L. Cannon*

This is the fourth in a series of articles dealing with the principal trade unions with which ICI has signed agreements

It would be difficult today to visualise to what extent British industry would have developed had it not been for the startling growth in the use of electrical energy. Yet little more than seventy years ago the workers who had elected to specialise in this newly emerging field of industry were considered not skilled enough to join their brothers in the ranks of the already powerful and highly organised Amalgamated Society of Engineers.

The first meeting of the Electrical Trades Union was held in a smoky pub in one of the narrow twisting alleys which at that period formed a bewildering labyrinth round Blackfriars Street in Manchester. The A.S.E., with a show of paternal benevolence to their "unskilled" brothers, gave a copy of their own rule book for the guidance of the aspiring electrical trade unionists.

It was from these small beginnings that our union, with its present-day 270,000 membership, sprang.

Today our members play a vital role in all the major industries of the country—without them the wheels of industry would rapidly grind to a halt. The newly expanding industries upon which our future prosperity depends have been made possible only by the great technological advances in the application of electricity.

The first world war and the immediate post-war years saw a rapid expansion of the trade union movement. This, together with the growth in the use of electricity, brought an increase in E.T.U. membership from some 8,000 pre-war to over 31,000. The results of this were soon made apparent by more effective negotiations at national level, and for the first time in history a national wage increase was negotiated with the engineering employers. Up to 1917 all rates had been negotiated on a district basis, which often tended to leave the members in rural areas at a disadvantage. The pattern of national negotiations has continued, and with the growth of the union and its coverage of practically all industries national wage agreements in the various industries have been concluded, either by the E.T.U. itself or in conjunction with other interested unions. Local negotiations with Imperial Chemical Industries gave way to the first national agreement in September 1936.

The actual structure of our union does not differ radically from the general pattern of craft unions. The basic unit is the branch, of which there are 700 scattered throughout Great Britain and Northern Ireland. The day-to-day life of the branch is in the hands of the voluntary Branch Officers, who are elected annually by its members.

Mr. L. Cannon

The second level of the union's organisation is the Area Committee. The individual branches, which are grouped into geographical areas, send one representative each to sit on their Area Committee. This committee is responsible for the operation of the union's agreements in the various industries in the area, and all our shop stewards are responsible to the Area Committee for their work at job level.

Each area, depending on its membership, elects one or more full-time officials, who work in conjunction with the Area Committee. They serve in office for a period of five years and are held directly responsible to the Executive Council.

The general management and control of the union are vested in the hands of the democratically elected Executive Council, which is composed of the General President, the General Secretary, the Assistant General Secretary, and eleven rank and file members, each representing a geographical electoral division. There is also a team of five National Officers who represent the union on the various national negotiating bodies with which the union is associated.

A Policy Conference is held every two years, which is composed of a delegate from every branch. This conference has the authority to determine policy, and also to challenge the work of the Executive Council during their two-year term of office.

TOP LEFT: *Hayes Court, Bromley, Kent, the Headquarters of the Electrical Trades Union.* BOTTOM LEFT: *Esher Place, Esher, Surrey, the E.T.U.'s residential college.*

Every fourth year this conference has the right to change the rules of the union.

A new rule has been introduced requiring the calling of Industrial Conferences, which will establish direct communication with our members in the different industries in which they work, as distinct from branch representation. We are, however, conscious of the need to examine trade union organisation, and our union supports wholeheartedly the decision of the 1962 Trades Union Congress to investigate the structure of the trade union movement. It is our firm intention to adapt the union's approach to new problems as and when they arise and to make such organisational improvements as are necessary with the advance in technology.

The forward thinking of the E.T.U. is reflected in the up-to-date layout and equipment of the union's head office. Hayes Court, standing in well-kept parkland, presents to the casual observer the tranquil picture of a bygone age. When one steps over the threshold, this impression quickly disappears. All the offices and departments are equipped with the most modern aids that it is possible to obtain to facilitate office procedure. Photocopying, printing equipment, microfilm cameras, and calculating machines of every description abound. In spite of this, a clerical and administrative staff of 65 work at a brisk tempo to keep the affairs of the union in order.

In addition to the primary services of a trade union, which is to provide workpeople with the most skilful negotiators in the collective bargaining machinery, our union provides a number of important benefits, including accident, unemployment, strike, victimisation and funeral benefits. We also provide legal aid.

Ours is one of the few unions which has its own convalescent home. Members who have had the misfortune to be away from work through illness or injury may spend a fortnight's convalescence in delightful surroundings under expert medical supervision. During their stay at the convalescent home, which provides the comfort and service of a first-class hotel, our members receive a generous allowance to cover any expenses incurred.

The E.T.U. is also justly proud of the fact that for many years past it has led the trade unions of this country in the field of education.

The founder members of the union had included a clause in the rule book which stated that one of the objects of the union was to provide educational facilities for the membership, and in recent years this provision has been fully implemented.

Esher Place, an imposing mansion in the French château style, was built in 1898 on a site that dates back to the age of Chaucer. It is now the union's residential college, and courses in such subjects as economics, history, work study, industrial relations, current affairs and trade union organisation are run throughout the year. Members come to Esher from all parts of the British Isles, by road, rail and air, at the expense of the union. While at the college they receive an allowance to help compensate them for loss of earnings during their stay.

Many past leaders of the E.T.U., having left their mark on the councils of the trade union movement, have been called to serve the public as leaders of the publicly owned electricity supply industry. Notable among these is Lord Citrine, one-time Assistant Secretary of the E.T.U., later T.U.C. General Secretary, who recently retired as chairman of Central Electricity Authority. There was also the late E. W. Bussey, who joined Lord Citrine, with responsibility for industrial relations in the Electricity Supply Industry.

We believe that the constantly expanding work of our college will help our union to make further and even greater contributions to the future development of the trade union movement in Britain.

ABOVE: *Mr. J. T. Byrne, General Secretary.* BELOW: *The Electrical Trades Union is host to visiting trade union leaders from all parts of the world. In this photograph Harry Van Arsdale, Manager of the powerful American International Brotherhood of Electrical Workers (centre) is pictured with Mr. Frank Chapple, E.T.U. Executive Councillor (left) and Mr. Leslie Cannon, E.T.U. Education Officer.*

People & Events

Statement of Results for 1962

The results for 1962, showing a record in the volume of Group sales to customers at home and exports reaching a value of over £100 million for the first time in the Company's history, received very wide coverage in the press.

The Times's report began: "Are industrial profit margins at last on the turn? This was the key question being asked in the City last night following the encouraging results of ICI and the Unilever twins who between them cover a wide cross-section of industry. An optimistic reading of these figures, and especially the improvement in profitability in the second half of the year . . . led to a firmer tone in the industrial share market in the late afternoon, and it would not be surprising if this trend were to be extended today." Commenting on the ICI results in particular, the report continued: "Only super-optimists had hoped for a rise in dividend. Maintenance of the 13¾% total with a final of 7½% was in line with general expectations. Among the most encouraging features of the ICI returns is that exports from the United Kingdom topped the £100m. mark for the first time."

The *Financial Times*, in its editorial column, also linked the ICI results with those of Unilever, and said that both were reasonably good. "From the point of view of the investor," it continued, "it is the ICI results which are the more significant. . . . This result, though it confirms the improvement in trading conditions suggested by the Monsanto figures, is significantly better than that achieved by the chemical industry as a whole. The *Chemical Age* survey found that 67% of all chemical firms, and 86% of the larger firms, had experienced lower margins during 1962. . . . ICI can expect to gain not only from a relatively sharp increase in sales of plastics but probably from a marked revival in demand for synthetic fibres."

The Guardian also said that ICI's performance was good, and added that the bald statistics of the results did less than justice to the Group's effort.

The *Daily Mirror* carried its report under the banner headline "Giants End the Profit Slide." The report began: "Splendid news this morning from ICI and Unilever, the two biggest companies in Britain. ICI . . . and Unilever . . . step up with bigger profits for 1962. And that was one of the toughest years the nation's industry has had to face since the war. Last night a delighted City grasped the news as the first real hope that Britain's bosses may at last have stopped the great slide in profit . . . and started struggling upwards again." It concluded: "A flash in the pan? I doubt it. The City believes that these two great companies may well have turned the corner. And that others are following close behind."

Group Profit and Loss Account of Imperial Chemical Industries Limited and its subsidiaries at home and overseas for the year ended 31st December 1962

1961 £ million		1962 £ million
550	Group sales to customers at home and abroad	579
61·8	Group income before taxation	70·4
	after providing for:	
40·5	*Depreciation*	44·5
8·7	*Employees' Profit-Sharing Scheme*	6·7
27·7	*Less: Taxation*	32·0
34·1	Group income after taxation	38·4
1·7	*Less: Applicable to minority members of subsidiaries*	2·4
32·4	Group income after taxation applicable to Imperial Chemical Industries Limited	36·0
3·6	*Less: Undistributed income of subsidiaries applicable to Imperial Chemical Industries Limited*	3·2
28·8	Income of Imperial Chemical Industries Limited for the year after taxation	32·8
	Appropriations	
4·5	*Capital reserve (including the benefit of the tax relief due to investment allowances)*	5·5
0·8	*Revenue reserve*	3·5
5·3		9·0
1·1	*Net Dividends: Preference*	1·1
22·4	*Ordinary*	22·7
28·8		32·8

London University Reception. *To mark the renewal of the ICI Research Fellowship Scheme a reception was given by London University on 30th January for past and present ICI Fellows and Turner and Newall Fellows in the University. Mr. S. P. Chambers, ICI Chairman, was guest of honour and is seen here being welcomed by the Vice-Chancellor, Dr. P. S. Noble*

ICI's Research Fellowship Scheme

The ICI Research Fellowship Scheme has been renewed for a further five years. The total number of Fellowships remains at 103, but the average value has been increased from £900 to £1000 per annum, and in future fellows will be allowed, with their professor's approval, to spend up to one year at a European research centre. This is felt to be appropriate in view of the increasing overseas interests of the Company. The cost to ICI of the revised scheme will be about £105,000 a year.

The ICI Research Fellowship Scheme was started in 1944 to assist post-doctoral scientific research in universities in Great Britain. The fellowships may be held in the general fields of chemistry, physics, biology, engineering and technology, but the subjects of research need not be directly related to ICI's interests. The purpose of the scheme is to help to maintain vigorous schools of research in British universities, in the firm belief that the existence of these must in the long run be of great value to industry generally.

Professor R. S. Nyholm, in a recent article on the ICI scheme in the *New Scientist*, quotes some interesting figures indicating the calibre of the scientists and engineers who have been ICI fellows. By 1961 at least 40 former fellows occupied full professorships and 13 had been elected to fellowships of the Royal Society.

The Fellowship Scheme represents only a part of the way in which ICI assists the universities. It also gives grants for new buildings, special apparatus and chemicals, support for publications, and so on, which brings the Company's total contribution to more than £300,000 a year.

ICI Board Changes

The retirement of **Mr. Eric Bingen** and **Mr. Clifford Paine** from the ICI Board, noted elsewhere in this issue, brought about some reallocation of responsibilities of Directors, the election of a new Deputy Chairman and the appointment of a new Director.

Mr. Peter Allen succeeded Mr. Bingen on 1st April as one of ICI's Deputy Chairmen (jointly with **Dr. Ronald Holroyd** and **Mr. Leslie Williams**). Mr. Allen, who is 57, was formerly Overseas Director responsible for Western Europe, a job he took over early last year after three years in Canada as president of CIL. He has been a Director of ICI since 1951. Mr. Allen's responsibility for ICI activities in Western Europe has been taken over by **Mr. Michael Clapham** in addition to his present duties as an Overseas Director.

Mr. Whitby

Mr. Harold Smith, formerly Technical Director, has taken on Mr. Paine's duties as Director in charge of Fibres, Heavy Organics and Plastics Divisions, and **Mr. George Whitby,** former Chairman of Fibres Division, is the new Technical Director.

Mr. Whitby, who is 50, joined the 'Terylene' Council at its formation in 1951 after being Deputy Chief Engineer at Wilton Works. He became Joint Managing Director of the 'Terylene' Council in 1954 and of Fibres Division on its formation in 1956. He was appointed chairman of Fibres Division in 1960 and is also a director of Fiber Industries Inc. He holds an OBE for wartime services when he was seconded to the Ministry of Supply, Armaments Design Department, where he ultimately became Assistant Chief Engineer responsible for rockets and guided missiles.

Mr. Whitby is married and keeps a pony for each of his two young daughters to enable them to appreciate the Yorkshire countryside. He himself likes the outdoor life, although he now concentrates more on his golf than, as formerly, on going for long walks over the Dales.

New Fibres Division Chairman

Dr. Edward Abbot, hitherto a Joint Managing Director, has succeeded Mr. Whitby as chairman of Fibres Division. Dr. Abbot, who is 52, joined the Dyehouse Department of Dyestuffs Division in 1936 and was with the Division until 1951, engaged on a wide range of technical service activities, with particular reference to dyestuffs and organic chemicals and their application to textiles.

In June 1951 he was appointed Technical Service Director of the 'Terylene' Council and subsequently of Fibres Division on its formation. Later he also assumed the responsibilities of Development Director. He was made a Joint Managing Director in July 1960.

Dr. Abbot is married and has a son and daughter. Like many a Scot he is a keen golfer, a game which he plays regularly. An enthusiastic gardener, he specialises in the cultivation of roses and sweet peas.

Dr. Abbot

New fashions and a new hotel. *A joint ICI/Hardy Amies fashion show, seen by an audience of nearly 1000, was staged at the new London Hilton in Park Lane on 5th March.* ABOVE: *Some of the uniforms for the hotel staff, designed by Mr. Amies and largely made of 'Terylene' fabrics. The setting for the photograph is Hyde Park, where road redevelopment is in progress, and the London Hilton is seen in the background.*

ABOVE: *Besides couture clothes, the show also included some of the budget-priced separates designed by Mr. Amies for the Maxton Blouse Company. Here is a matching top and skirt in printed 'Terylene' which costs £9 4s. complete*

Inventor of 'Terylene' Retires

The inventor of 'Terylene,' **Mr. John Whinfield,** retired from ICI on 28th February. He had been with the Company since 1947 and had been a director of Fibres Division since 1956.

It is just 22 years since Mr. Whinfield's experiments in the Accrington laboratories of the Calico Printers' Association produced 'Terylene' polyester fibre—the first all-British synthetic fibre. Today 'Terylene' is a household word.

The original full-scale ICI 'Terylene' plant at Wilton has been expanded until its capacity is 65 million lb. every year, and the Fibres Division now directly employs over 4000 people on the production and marketing of 'Terylene.' The world production of polyester fibres is now about 450,000,000 lb. a year, giving direct employment to 30,000 people—quite apart from the large numbers employed in providing the raw materials and processing the fibre.

Mr. Whinfield, who is 62, has travelled widely in the course of his service with ICI. Last year he was invited to visit Russia by the Council of Ministers, and his travels have also taken him throughout Europe, Australia, India, the United States and Canada. He was awarded the CBE in 1954. Mr. Whinfield and his wife both originate from Surrey, and they are retiring to a house in Betchworth, near Dorking.

Mr. Whinfield

More 'Melinex' Film

Plastics Division's capacity for the production of 'Melinex' polyester film is to be doubled by the end of 1963 under extensions which are now being carried out at Dumfries.

The present capacity of the plant, which started up 15 months ago, is 2000 tons a year, but during that short period sales of 'Melinex' have risen to record levels, both at home and overseas. With the continued expansion of the market, the new extensions will make Plastics Division the largest producer of polyethylene terephthalate film in Europe.

Much of the increased capacity will be used for the manufacture of new grades, widths and thicknesses of 'Melinex' film by methods covered by ICI's own patents.

Gardeners' Sunday

Once again the grounds of Warren House, ICI's staff training college at Kingston-on-Thames, are to be opened to the public under the Gardeners' Sunday Scheme. They will be open from 2 to 6 p.m. on 5th May, the first of the official "Gardeners' Sundays." It is hoped that the unusually cold weather will not preclude the splendid show of azaleas, for which Warren House is noted, from being at their peak and the rhododendrons starting to flower. As last year, there will also be an exhibition staged by the County of Surrey Flower Arrangement Association.

Last year on Gardeners' Sunday Warren House had nearly 2000 visitors and over £130 was collected for the Gardeners' Royal Benevolent Society and the Gardeners' Orphan Fund.

Warren House is only one of hundreds of gardens up and down the country being opened to the public in this cause this summer. They are listed in a booklet (1s. 3d. post free) available from the Organiser, Gardeners' Sunday, Four Winds, Seale, Farnham, Surrey, or to order through all branches of W. H. Smith bookstalls.

Binding of 1962 Magazines

The Kynoch Press has again undertaken to bind *Magazines* and inserts for those readers who would like this done.

The cost will be 13s. 3d. for a volume of *Magazines* or a volume of inserts, and anyone who wants to take advantage of this offer should advise his *Magazine* correspondent now.

Dr. Joseph Chatt

At the request of the Agricultural Research Council, **Dr. Joseph Chatt,** FRS, is being released from ICI in order to take charge of a team to work on the fundamental chemistry and other aspects of the biological fixation of nitrogen.

Dr. Chatt, who is at present at Yale University on a visiting professorship, is 48 and was elected a Fellow of the Royal Society in 1961. He has been with ICI since 1947. Before that he held the post of chief chemist with Messrs. Peter Spence & Sons Ltd. and from 1946 to 1947 an ICI Research Fellowship at London University.

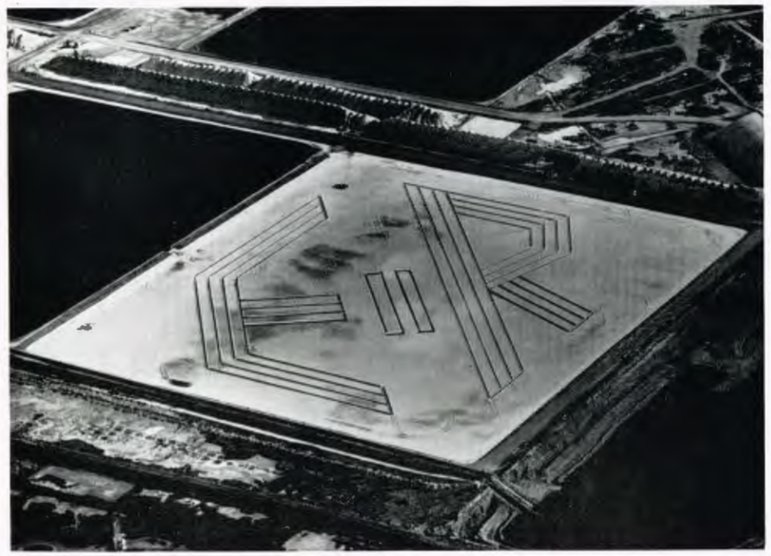
Dr. Chatt

Dr. Chatt's place at the head of the ICI organo-metallic research team, until recently located at The Frythe, Welwyn, and now mainly at the new Petrochemical and Polymer Laboratory at Runcorn Heath, is being taken by **Dr. Edward Stern.**

Whose Walls are Whiter?

After the fog and freeze-up of the winter months, many readers may have decided that their spring cleaning plans this year will need to be extended to include some redecorating too. For those readers a recent introduction in the 'Dulux' range of paints should be of interest. It is Brilliant White Gloss, developed by Paints Division in response to the increasing demand for white paint, and in particular for a white paint that will not only be whiter when first applied, but will stay whiter.

'Dulux' Brilliant White Gloss meets this demand. It has brilliant initial whiteness and excellent resistance to yellowing, and in addition to this it has the advantage of exceptionally high opacity.



A Queen's welcome—in salt. *The ICIANZ saltfields had a huge "welcome"—probably the largest in South Australia—for the Queen when she flew into Adelaide on 19th February. The royal cipher* EIIR *was ploughed into the gleaming white salt of the crystallising pond and coloured with a dark green dye for contrast. The letters, carved diagonally across the pond, were 750 ft. long*

Decorating Primer

Do-it-yourself enthusiasts should also find a new book, *Painting and Decorating*, by William Tee (Arco Handybook, 15s.), very useful. William Tee is one of the pennames of **Mr. Alan Taylor,** who until his retirement at the end of last year was Overseas Publicity Officer for Paints Division.

Written especially for the handyman and handywoman, the book covers every aspect of the subject in easy-to-read form. Technical terms are reduced to a minimum.

It tells one how to get the best results that will last, and how to do the job in the quickest possible time with the least disorganisation to the household. It gives a clue to many short cuts which can successfully be put into operation by the home handyman. Not only is it a how-to-do-it book but a book on *why* it should be done in that way.

Painting and Decorating discusses the selection of colour schemes, measuring up and preparing the paint for use, the importance of primers, and of handling tools in the professional way, and it gives particular attention to special surfaces, such as doors, windows, bathrooms and kitchens, metal surfaces and damp walls. It also discusses cleaning up and how to keep the finished decoration in tip-top condition.

Safety Cup Results

Heavy Organic Chemicals Division, with a 29·4% improvement on their accident frequency rate over the twelve months ending on 31st December, are the latest winners of the ICI Safety Trophy. Their frequency rate showed an improvement from 0·473 to 0·334. They last won the competition in 1958. The runners-up are Billingham Division with an improvement of 3·9%. They were the only Divisions to improve during the twelve months on their previous competition best.

Retirements

Some recent announcements of retirements include: **Dyestuffs Division:** Mr. H. Birchall, Director and Chief Engineer (retired 31st March). **Fibres Division:** Mr. J. R. Whinfield, Director (retired 28th February). **General Chemicals Division:** Mr. G. E. Sutton, Finance Director and Chief Accountant (retired 28th February), Mr. C. J. P. Bateson, Personnel Director (retired 28th February). **Head Office:** Mr. E. A. Bingen, a Deputy Chairman (retired 31st March), Mr. L. S. Newman, Investments Manager (retired 31st March), Mr. C. Paine, Group C Director (retired 31st March).

Wallpapers that Really Wash

Elsewhere in this issue the Editor discusses with **Mr. John Rose,** a Joint Managing Director of Paints Division, ICI's plans for increasing its stake in the wallpaper market through the Withins Paper Staining Company. Another subsidiary of the Paints Division, ICI (Hyde), also has its eye on the wall decoration business. It has just launched 'Vymura,' paper-backed tough vinyl which combines the decorative effect of a really good wallpaper with the protective strength of vinyl. 'Vymura' is not harmed by oil, grease, fruit juices, ink or dirt, and ICI (Hyde) say that tests have proved that it will stand up to scrubbing twice a week for twelve months without damage of any kind.

Forty-nine individual effects have already been created for the 'Vymura' range, some of which are seen in the photograph on the right. 'Vymura' is aimed at the contract market, for schools, restaurants, offices, waiting-rooms—wherever walls come in for hard wear. Although not cheap, it would none the less be a very good investment in the home for staircases, kitchens and the like. Orthodox adhesives, as for heavy wallpaper, are quite suitable for 'Vymura,' provided they contain an approved fungicide.

'Vymura' comes in ready-trimmed rolls, 11½ yards long and 21 in. wide, at a retail price of 50s. It is distributed exclusively by E. N. Heath & Co. Ltd. and John Line & Sons Ltd.

Some of the patterns *in ICI (Hyde) Ltd.'s new 'Vymura,' vinyl-printed wall covering*

First Aid Finals. *For the second year running a team from Alkali Division's Winnington Works carried off the ICI First Aid Trophy on 7th March. They are seen above receiving the trophy from Mr. Leslie Williams, Deputy Chairman. Dyestuffs Division's Huddersfield Works were the runners-up and HOC Division's Wilton Engineering Works team, making its first appearance in the finals, came third*

New factory in Northern Ireland. *A panoramic view of Fibres Division's new Kilroot Factory in Northern Ireland which was officially opened on 22nd March by Captain the Rt. Hon. Terence O'Neill, Minister of Finance, Northern Ireland. When in full production capacity will be about 25 million lb. of fibre a year, and the factory will eventually employ around 750 people*

Advice from an expert. *A man who knows his maps, Sir John Hunt of Everest fame, gets down to some serious planning with Billingham Synthonia Junior Club members (left to right) David Scarr, Derek Scholes and Edward Downes. Sir John's visit to the club was an informal one and lasted over two hours. Last year the club won thirty-six awards, more than any other club in the Duke of Edinburgh's Scheme*

50 Years' Service

Mr. G. Turner
Alkali Division
(1st February)

Mr. R. Adams
Nobel Division
(1st March)

Obituary
Sir William Coates

Sir William Coates, a former Deputy Chairman of ICI, died at Eastbourne on 7th February. He was 80. Sir William joined Nobel Industries Ltd. from the Civil Service in 1925, as Secretary in succession to Sir Josiah Stamp and became the first Treasurer of ICI on the formation of the Company in 1926. He was appointed a director in July 1929 and elected Deputy Chairman in 1945. After his retirement from ICI Sir William was for seven years a deputy chairman of the Westminster Bank. He was knighted in 1947.

Sir William Coates

The Chairman writes:

My connections with Sir William Coates go back a very long way, although some of my colleagues did, no doubt, know him before I did. He became Director of Statistics and Intelligence in the Inland Revenue in 1919, succeeding Dr. Josiah Stamp (later Lord Stamp): it was this post that he left in 1925 to join Nobel Industries.

For precision and clarity of thought Sir William was quite outstanding, and he was an exceptionally good chairman of a meeting, as those who, years ago, attended the meetings of Central Council which he chaired will appreciate. In the US anti-trust case against ICI and du Pont his masterly analysis of the advantages to both Britain and the United States of the co-operation between the two companies evoked praise from the American judge.

It was Sir William Coates who suggested that I should join ICI, and shortly after joining the Board in 1947 I succeeded him as Finance Director and inherited the very efficient financial organisation which he had built up.

It is now over twelve years since Sir William Coates retired, but much of the fruit of the fine work he did for the Company remains.

Mr. E. A. Bingen writes:

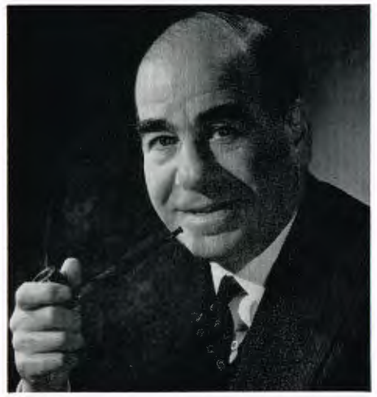
Billie Coates, as was to be expected of one who graduated into industry from the Civil Service, was a master in marshalling his arguments and in writing clear and compelling memoranda (and speeches) on a wide range of economic and financial subjects. In clarity of reasoning he stood out among the pre-war executive Directors of ICI, but this did not mean that he always got his way in policy decisions, since his colleagues, with many years of commercial experience behind them, were apt on occasions to adopt a pragmatic rather than a logical approach to the subject under discussion.

It was perhaps in the organisational structure and financial set-up of ICI that Billie Coates made his greatest contribution. The bringing together of four large public companies with different backgrounds and traditions posed many problems, not only of administration but of finance and accountancy, and his clear mind and incisive approach to the problems involved were to be seen in the gradual evolution of ICI into what it is today.

I had the privilege of working for and under Billie Coates in many and varied matters with a legal flavour almost from the inception of the Company until his retirement in 1950, and I knew his little foibles while appreciating his consummate abilities and great kindness of heart, which, with his somewhat reserved disposition, he did not easily expose.

Two instances stand out in my mind where he showed his mastery of the subject and great dialectical abilities. The first was when, in our Capital Reorganisation Case in 1935, he was cross-examined in the Chancery Division by Sir William Jowitt, then leader of the Common Law Bar, and made absolute rings round him; the second was in our anti-trust litigation in the United States immediately after the war, where he was our star witness and was so persuasive that if anybody could have produced a verdict favourable to us he would have been the man to do so. Few others could have been such versatile performers or ended up as a Deputy Chairman of Westminster Bank for seven years after leaving ICI at the age of 67.

Mr. Bingen and Mr. Paine Retire



Mr. Bingen Douglas Glass

Mr. Bingen, who has been a Deputy Chairman since July 1959, joined ICI in 1927 as an assistant solicitor after a distinguished academic career in jurisprudence. He was for some years Head of the Company's Legal Department and was appointed to the ICI Board as an Overseas Director in 1951.

The Chairman writes:

Eric Bingen's retirement will be a loss to everybody, but particularly to his colleagues on the ICI Board and to me as Chairman. He was the Company's Solicitor for many years until in 1951 he joined the Board and became an Overseas Director, a switch of duty which could only have been successful with somebody whose mind could move easily from the precision of legal work to the whole range of judgment of people and conditions of all kinds which is such a large part of the duty of an executive Director of a company such as ours. In 1959 Mr. Bingen became a Deputy Chairman, and this gave further scope for the exercise of his powers of judgment, advice and decision.

Much of the work of the Main Board of ICI consists of making decisions on complex matters which are very important and frequently very controversial; different opinions can be held very strongly by very competent Directors. It is on matters of this kind that Eric's capacity to set out all the arguments for one course or another quite objectively and judicially, and then to suggest modestly which, in his view, would be the preferred course, has been of such outstanding value. As one non-executive Director put it to me: "The point is that Eric Bingen is generally right." On the rare occasions that the Board has adopted a contrary view, Eric Bingen has accepted the judgment graciously and without reservation. One secret of his energy and capacity for patient, objective reasoning must, I am sure, be his outstanding health; during the fifteen years that I have been on the Board I cannot remember his absence on account of sickness for a single day, and I believe the record goes back further than that.

All his colleagues will greatly miss Eric Bingen from the Board table and from the many other meetings which he attended, but none will miss him more than the Chairman himself.

Mr. Bingen has also done most valuable outside work, including what he did as a member of the Jenkins Committee on Company Law reform. There are already substantial calls upon his time, and in wishing him many years of retirement from the Company's service we all know that these will be fully and very usefully occupied.

Mr. Paine

Mr. Paine retires after more than 45 years' service with the Company and its predecessors, for the last nine of which he has been a member of the ICI Board. He joined the Research Department of Levinstein Ltd. in 1917, which later became a constituent company of British Dyestuffs Corporation Ltd., the forerunner of the Dyestuffs Division. In 1943 he was appointed Research Manager of the Dyestuffs Division and a director of that Division in 1947. In 1951 he was appointed joint managing director and in 1952 chairman of the Division.

The Chairman writes:

Clifford Paine's long career in ICI, culminating in nine years on the Main Board, has throughout been quite outstanding, and we are all going to miss him greatly. His colleagues on the Board in particular will feel the loss of his wise and clearly stated judgments in an exceptionally wide range of subjects, for versatility is perhaps the most obvious of Mr. Paine's many qualities.

With a background of 37 years in Dyestuffs Division he brought to the Board an intimate knowledge and experience of the textile industry, of intricate organic chemical operations and of research. Clifford Paine's contributions, however, have not been limited even to this wide field, for his specific responsibilities as a director have been successively Development, Group A and Group C, clearly demonstrating his energy as well as his scope.

Clifford Paine will be missed not only for his business contributions but equally for the sincere and friendly co-operation which his colleagues have enjoyed. Always outspoken, he combines a readiness for open-minded objective discussion with a dogged adherence to a view or principle once formed. His interest in people of all kinds is another characteristic which, among other things, has resulted in his being a most able negotiator.

Mr. Paine's versatility is shown in his outside interests as well as in his work for the Company. For 15 years he was chairman of the Wilmslow Guild in Cheshire, which is the largest adult education centre in Britain. He has been president of the Society of Dyers and Colourists, vice-president of the Royal Institute of Chemistry, and in 1956 had the honour of giving the Perkin Centenary Lecture. For good measure he is interested in amateur theatricals, paints in watercolours, is no mean photographer, is keen on gardening, and has been accused of having too favourable a golf handicap. Thus, in wishing him health and happiness in many years of retirement, I do so confident that he will continue to enjoy a very full life which will benefit others as well as himself.

RETIREMENT
it can happen to you!

A. W. Baldwin

Most of us don't begin to think about retirement until we have reached our early fifties, when the careless rapture of working has faded somewhat, when we begin to think twice about chasing buses or picking fights, and when leaping over five-barred gates has become more of a chore than a delight. It is true, of course, that on wintry Monday mornings such thinking extends to a wider age group, but generally speaking we don't give serious thought to the time when we shall be turned out to grass until we are getting a shade long in the tooth. And the odd thing is that many of us have mixed feelings about it. To some of us it looms as a problem. And if such misgivings enter your head you would be wise to take heed of them. They are a forewarning that there are indeed problems of retirement, in your case at least. You will need to use your loaf, and you'd better start now. And don't think that these few words are going to help. I haven't got the answers. I am merely making a few observations.

If you are one of the wise ones who have cultivated a hobby, such as transcribing bagpipe music, performing on the musical glasses or lion-taming, you can look forward to devoting ample time to your favourite pastime, which is fine and dandy. Or if you are one of those heroes who are determined to take on another job and to work until they drop in their tracks, the best of luck to you. I am concerned with those feckless characters who are looking forward to a rest, to taking it easy and to doing nowt, which was my own outlook on the matter. And the first thing I have to say is that you won't get as much rest as you think, brother. Let's begin at the beginning.

When you are at the point of retiring your friends and colleagues, bless their hearts, will wish to give you a good send-off. They dig into their pockets to make you a retirement present, and this in the clear knowledge that there is no hope whatever that they will get anything from you in return, either now or in the future. There is no nobler gesture to be seen in this vale of tears. Then comes the day when the presentation is made, as like as not by your boss, in the presence of your friends. At that ceremony you hear things about your ability and intelligence, your lovable nature and your general popularity which portray a paragon whom you completely fail to recognise. Surely if you were half as good as he is now saying, your boss would be tearing his shirt to get you to stay on. Frankly, it's a load of cod's wallop, but he only says it out of the kindness of his heart and is therefore to be forgiven. Don't let it go to your head, and don't bask for too long in the glow of those beautiful words, because you are now expected to get up on your hind legs and reply. This is a tricky moment, and you would do well to watch it.

Your natural inclination is to indulge in reminiscence—we all do it. We can't look forward as far as work is concerned, we can only look back. But remember that every living soul in your audience is younger than you, many of them a great deal younger, and they just do not get wildly excited by mumbled memoirs of Blackley Works in the old days. It is not a bad idea to try out your reminiscences on your own young folk. I am reminded of the American grandma who was baby-sitting and trying desperately to get her tiny granddaughter to bed an hour later than the time specified by the child's parents. Finally she got a solemn promise out of the brat that she would go to bed, and to sleep, after just one itsy-bitsy story. So the old lady began, "Many years ago, when grandpapa was a little, tiny boy——" at which point she was interrupted by the piping treble of the little girl: "Aw gee, Grandma, I'm just about sick and tired of that old slob! Tell me about the days when you were a tart in Chicago!"

Well, at last it is all over and, after a last look round, you go home. Not for the weekend, or a month's holiday, but for keeps. As the coloured man, having just been given a life sentence for armed robbery and been asked by a friend how long he would be in gaol, replied, "Oh, jess from now on, I guess." It's a distinctly odd feeling and takes quite a bit of getting used to.

I think that this is the moment when I bring the little woman into the picture, for it is at this point, or pretty soon, that you have to think about her if you don't want to lose a few medals. Naturally, for the first few weeks she is just as delighted at your

"She is a thoroughly admirable woman"

new-found freedom as you are, possibly because she hasn't got to get up early on perishing cold mornings to get your breakfast ready. But after a month or so, if you watch carefully, you will see her giving you some rather old-fashioned looks. The fact of the matter is that the dear girl is finding the old man's presence in the home, all day and every day, not quite the barrel of fun she thought it was going to be. For one thing, take lunch. Now I'll bet you anything in reason that her idea of lunch for herself on a weekday is a couple of Danish pastries and a cup of coffee. But that won't do for you, old rumble guts, will it? Then take daily conversation. You haven't any news, have you? Not long ago, when you came home from the office, laboratory or workshop, there was the gossip from work to liven the evening meal. How your merry laughter rang out when your boss caught mumps from his children! Then there was that affair (or so everybody said) between Mr. Thingum and Miss Whosit. You don't bring any morsels like that home now. Let's face it, you're a bit of a dull dog, a lot more work—and underfoot to boot. You must think up some way of brightening the little woman's day, and I can't help you a bit. You know her better than I do.

You have reached the age when you are very probably concerned about your health. For some years now you have been noticing your shoulders drooping, your waistline spreading and the spring going out of your stride. Not very surprising in view of the sedentary nature of your job in recent years. It would be nice to get into really good shape again. Well, of course it would, but watch it! You can't turn the clock all the way back, so, whatever you have in mind, take it gently. Do not plunge madly into the daily exercise lark unless you are one of those who can see the comical side of slipping a disc or rupturing yourself.

If I were asked what single thing seemed to be paramount in retirement I would say that it is the number of times a day I have to change my clothes. I must say I didn't foresee that one. When I was working for my living I would turn out around 8.15 in the morning in the usual business outfit, and I would generally stay in that uniform until I hit the sack about 11.30 at night, say. But it's quite different now. For one thing I've got my jobs to do —garden, messing about with the car, romping around under the floorboards looking for dry rot—you know the sort of thing. In among these I've probably got to pop into the village, or I might, if I'm dead lucky, break off for a round of golf. Then I must make myself presentable for the evening because, even if we are not going out, "somebody might call." And it all means a change of uniform every time, because, for the rough jobs, I simply must dress the part. Of course, you might be as clever as that infuriating fellow Barry Bucknell, whom I have seen doing

the most complicated things with cement, plastic paint or carpenter's tackle and, apart from having removed his dapper jacket, looking tidy enough to stroll into a Head Office conference. But that just isn't me. When I am applying emulsion paint to a ceiling my appearance becomes such that children and nervous women take to the woods at the sight of me. So, what with one thing and another, it's a case of in and out of different clothes like a chorus girl in the Follies.

It goes rather like this on a typical day, if there is such a thing. Sitting after breakfast in my dressing gown, unshaven and unkempt as an elderly beatnik, I am startled by hearing the butcher's small delivery van turn into the front gate a good three-quarters of an hour before his usual time. I beat a hasty retreat to the bathroom. Not that I don't like the butcher. Old Joe is a friend of mine, in fact, but I cannot do with his hearty remarks if he catches me in my dressing gown. Even so, while shaving, I can hear his booming voice from the kitchen asking for my whereabouts, adding, "Don't tell me the ruddy old layabout isn't up yet!" I don't think of a really suitable rejoinder until he is away on his rounds again. Then, before dressing, the big decision has to be taken as to what particular form of serfdom is the order of the day. Well, the garden is needing attention and if I put in a good morning's stint at that maybe I can have a round of golf in the afternoon with a clear conscience. Right—garden it is, and on with my gardening clothes.

I have done no more than cut a couple of swaths in the lawn when it starts to rain—good, steady Manchester stuff. The lawn looks like a man with a half-finished haircut; but that can't be helped, so I put the tackle away and scamper back indoors. What instead? My bride would be pleased if I could do some shopping for her in the village. I am a shade disgruntled at this, as it means climbing into some tidy clothes. Having done so, however, and when stepping out into the rain with shopping list in pocket, I see Mrs. Hyphen-Smith making her purposeful way to our house. She is a thoroughly admirable woman, chairwoman of this and that committee, town councillor, Justice of the Peace, working herself to the bone for the public weal. My wife admires her greatly. For myself, I am now quite pleased that I am going shopping, as I don't wish to talk to the old battleaxe today or any other day.

Back from the village, and having spent far too long in the library and found nothing worth reading, it is getting on towards lunchtime. It has just stopped raining, but the garden is drenched. Percy Thrower could doubtless think of a thousand useful things to do in it, but I'm damned if I'm going near it. The weather is far too uncertain to chance a wasted journey to the golf club—we really must think seriously of moving nearer to it—so the question still stands, what to do? So I seize the bull by the horns and, as smug as you please, announce that I shall paint the smallest room in the house. It wants doing, anyway. After lunch, therefore, I get into my decorating clothes and my wife departs for the village, since, as usual, something was overlooked when I went in the morning. As she steps out she asks me, for the last time, if there is anything I need. No, there is not. Then I start on the job, reckoning that I can at least get it well rubbed down before Coronation Street, to be followed by Z Cars (mustn't miss those!). It is at this moment, and my wife now out of earshot, that I discover that I have only a titchy bit of wet-and-dry sandpaper. I sum up the situation in pure Anglo-Saxon and get cracking. But before the job is a quarter done, and the easy parts at that, the wet-and-dry paper has become a piece of limp, smooth, useless rag, and when my beloved returns I am sitting listening moodily to Woman's Hour. To make matters worse, it has turned out a quite glorious afternoon, and I could have been having such fun with my elderly playmates on the golf course. Damn!

Summing it all up, you will find that you are much more influenced by the weather in retirement than you were in your working life, unless you were a window cleaner or a steeplejack, and the weather report is as important to you as Sports Report. Since one can never tell what the blazes the weather is going to do from one day to the next, why—there is never a dull moment!

One man and his job

Shepherd

It comes as something of a surprise to find the job of shepherd listed on the books of Britain's biggest chemical concern. In fact there is not just one shepherd employed by ICI but several, among them 50-year-old Percy Billing, shepherd on the farm at Jealott's Hill Research Station. Mr. Billing, who has less than a year to go to qualify for his ICI 30 years' service watch, recently received an award from the East Berkshire Agricultural Society as the agricultural worker with the longest service with one employer in East Berks.

The Jealott's Hill farm, in the heart of the Berkshire countryside about thirty miles from London as the crow flies and eight miles from Windsor, is controlled by Billingham Division. The original farm was bought before the ICI merger in 1926 by one of the forerunners of Billingham Division, but it has been added to considerably over the years and it now comprises some 540 acres.

Of the 500 acres farmed, about 200 are given up to cereals, a further 50 to experimental plots, and the remainder to grass, on which is maintained a large dairy herd and a substantial flock of sheep. The farm is run on a profit-making basis and employs the latest techniques in order to achieve this end, but the farming is subservient all the time to experimental needs. A normal farm of this size, Mr. Billing explained, would have its complement of pigs and poultry. But Jealott's Hill does not. Here they concentrate on crops or animals which can provide a valuable object lesson of the advantages of using ICI fertilizers.

Percy Billing has by far the longest service of any of the agricultural workers at Jealott's Hill. In 1926 his family moved from Somerset on his father's appointment as ICI's first foreman at the farm. Three of his four brothers have also worked on the farm at one time or another. Curiously enough, his first job wasn't in the strict sense an agricultural one—he was the carpenter's assistant. But since then he has tried his hand at practically every job on the farm, fully justifying the description of skilled general worker. Having a mechanical bent, he was for many years engaged as a tractor driver and only took over the sheep two years ago on the sudden departure of the previous shepherd. The farm manager asked Mr. Billing to look after the Jealott's Hill flock of breeding ewes until he could find a suitable replacement. Mr. Billing agreed, liked the job, and has continued to undertake the shepherd's duties. He has never regretted his decision. His devotion to, and obvious pride in, the flock is plain as soon as he starts talking to you. He is proud, and rightly so, of his successes last year—he lost very few lambs and finished up with a crop of 168 lambs from a hundred ewes, which was almost a record for Jealott's Hill.

A less enviable record was established in the exceptional weather last January, when the farm was blanketed with snow all through the month. The sheep were penned in by the snow, and all their food—hay, silage and concentrates—had to be carted out to them. It says much for the hard work of Mr. Billing and his fellow workers that the sheep continued to thrive in the face of such extreme conditions.

No farm job is a sinecure, least of all a shepherd's. The first six months of the year are the toughest—at other times Mr. Billing is able to join in the general work of the farm. In January, when the breeding ewes are heavy with their lambs, their diet has to be carefully watched and various injections and dosings have to be given. (The Jealott's Hill flock is a fine tribute to the efficacy of Pharmaceuticals Division's veterinary products.) Lambing starts on the farm in mid-February and continues until early April. During recent weeks, therefore, Mr. Billing will have been on the job almost non-stop, snatching meals and a few hours' sleep as and when his charges permit it.

One new skill Mr. Billing has had to learn in the past two years is shearing. This takes place in May. But meat rather than wool is the main dividend from the flock. The lambs are fattened and sold off in July, when the pasture begins to deteriorate. The bulk are sold to the Fatstock Marketing Corporation and some go to a local butcher.

As mentioned earlier, Jealott's Hill carries only crops and animals which can demonstrate the value of fertilizers. How, one may ask, do the animals come into the fertilizer picture? One of Jealott's Hill's major contributions to farming techniques has been in grassland management. Only in fairly recent years have farmers accepted that grass is a crop and that it therefore needs the same attention to fertilizing and proper management as any other crop. There are still many farms in Britain where the pasture is left to fend for itself and many more where fertilizer treatment is halfhearted. Many are therefore not stocked nearly as heavily as they might be. At Jealott's Hill they pioneered rotational grazing and silage-making and established the value of what is known as "early bite"—lush grass produced early in the year through the application of nitrogenous fertilizers. All this can be seen in practice on Jealott's Hill Farm, and Percy Billing's flock plays its part in helping to spread the gospel of better grassland management.

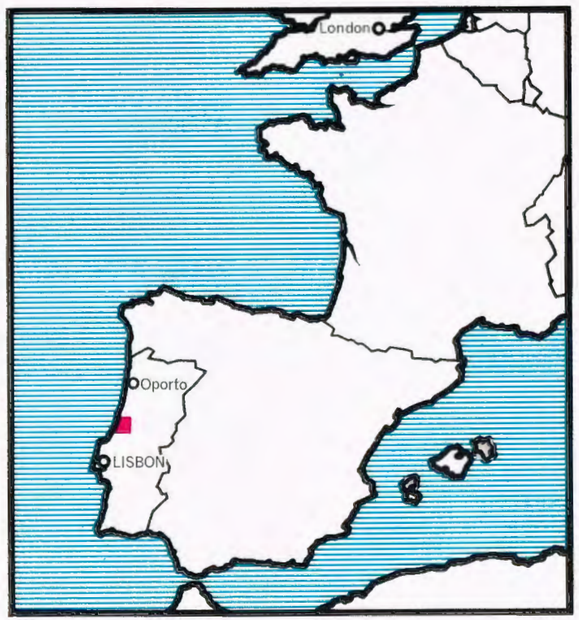
Percy Billing is married, with one son, and lives in a cottage on the Jealott's Hill estate. His wife also worked on the farm during the last war as a land girl. Off duty he enjoys a game of billiards or snooker, and he is a keen gardener, winning prizes in local competitions with his well-kept cottage garden. **A.E.B.**

Photograph by Patrick Ward

Portuguese Phrase Book

James Taylor

The days are distant when the prospective holiday-maker would think only in terms of the nearest seaside resort. Cheap rates, bulk travel, organised tours, off-peak flight bargains, to say nothing of the family motor caravan, have transformed the picture so completely that all Europe is now a holiday ground in season. Curiously, though multitudes have found their way to Spain of recent years, few have so far crossed the frontier into Portugal, whose claim for consideration as the centre for that elusive "holiday that is different" is here seen to be considerable.



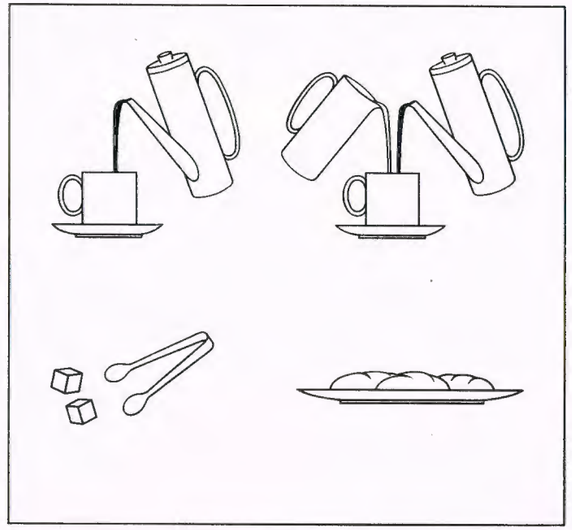
Everyone in England is convinced that a holiday, to be really successful, must be taken in continuous sunshine, and all are prepared to face the rigours of blistered backs, swollen legs, headaches and upset tummies if they can go back home like boiled lobsters. This is a survival of ancient Nordic sun-worship. My wife professes this religion with conviction and quiet faith, and while I conform, I am prepared to cheat. This I found I could do—and so can you—by choosing one of the Atlantic coast "praias" or beach resorts of Portugal. Two years ago we chose Ofir, a fine beach about 24 miles north of Oporto. Last year we selected San Pedro de Moel in Estramadura. Here, where the heavy Atlantic breakers thunder on to magnificent clean sand beaches, the air is fresh and bracing; the sun is hot, but the climate is variable, and there are some mornings and occasional days when the coast for a mile or two inland is blanketed with mist. It is not cold and clammy, as on our north-east coast, but comfortably warm, such that one can spend a pleasant session on the beach or walking in the woods. At times there may even be rain, and it's pleasant—for northerners—to sport in the milky breakers in the rain. It will tighten up your curves, girls, and do you a power of good; but if you have no bathing caps be careful of your perms. My wife ruined hers when knocked over by a large billow and went for the local hairdo, which included 15 minutes continuous scrubbing with a hard brush—a treatment that might be recommended to some of our "arty" types.

San Pedro de Moel is about 100 miles north of Lisbon, just off the highway which joins the capital to Oporto in the north. We followed this route, making short stops at a few of the interesting country towns, including Caldas da Rainha, where an open-air market was in full swing. Caldas is a centre for ceramics. There were stalls full of cabbage-leaf plates and ashtrays, ceramic fruits, and various (to the British) unmentionable pieces, illustrating that streak of robust humour which is typical of "abroad."

I am modest and collect ceramic tiles. Many Portuguese houses have a decorative tile set in the wall. Some are large with a ship or picture of a saint, but those I prefer are the size of our ordinary fireplace tiles, white with blue and yellow decorations and an inscription. These are ordinary workaday tiles, not specially made arty products, which don't appeal to me. It's fun collecting these tiles, and backed with sponge rubber they make attractive teapot stands.

A short stay was also made at the fishing village of Nazaré with its commanding cliffs, its beach and picturesque fishing community. The fishermen wear baggy trousers rather like the Dutch, but in bright gaudy checks, and on their heads they have long black woollen stocking pirate caps with bobs. The women wear wide pleated skirts with numerous petticoats, and judging

TOP, RIGHT: *Fishermen unloading nets at Nazaré.* BOTTOM, RIGHT: *Beach scene at Nazaré*



LEFT: *A specimen page from the kind of phrase book the author looks for.* RIGHT: *Ceramic tile, meaning Wine Cellar, bought by Dr. Taylor in Coimbra*

by the way the skirts swing there must be some pretty provocative action of the hips beneath. We were told by a friend that the richer the woman the more petticoats she wears, but I favour the alternative explanation given in the guide book, which claims that the women wear seven skirts if they are single but only two if they are married. Personally, I should have thought it would be the other way on, but I lack first-hand experience and have only been able to count the skirts on the souvenir doll which my wife purchased. This certainly has seven skirts, but I've no means of knowing whether it is married or single.

At the Pensão

Shortly after Nazaré we arrived at our destination, San Pedro de Moel, not a fishing village but a beach resort in a setting of pine forests: a small cluster of typical Portuguese villas and houses, whitewashed and with facings of yellow and blue with red-tiled roofs bright and sparkling in the warm sunshine of a typical early August day. We were late for lunch, about 2.30 p.m.; but that doesn't matter in Portugal. One of the attractions is that you don't need to work to the clock as in so many English resorts, and if you dally another half-hour in the woods or at the beach, no one minds. In characteristic Portuguese fashion the pensão (pension) was scrupulously clean and polished. A twin-bedded room had been ordered, but I think the Portuguese must have concluded that this meant a bed for twins, rather than two beds in one room. However, after a discussion, which ranged from one bed with two rooms to two beds with two rooms, we finally got the message over, and within a quarter of an hour the twin bed was out and two single beds were in. Even with no language difficulty, I doubt if we could have done as well at home on the Sabbath day. Our Portuguese phrase book, though good, did not quite cope with this situation, and at one moment I am sure I gave the impression, which was received with polite interest as an oddity of the English, that one of us wished to sleep on the bed and the other under it. I would advise any visitor to Portugal to purchase a dictionary as well as a phrase book.

I once knew a chap who didn't speak a word other than English but travelled round the world alone in comfort. He was an accomplished sketcher, and if he wanted an egg or a chicken he drew one with a few strokes of his pencil. I'm thinking of getting out a book of little coloured illustrations instead of a phrase book so that I can use it anywhere.

Portuguese cooking is not greasy and is acceptable to most English palates. They have excellent quality fish of various sorts. They serve it with many more vegetables than we do: potatoes, french beans, shredded lettuce, rice, onions or peppers. If one does not like a particular item, alternatives are readily available, e.g. a good selection of omelettes.

Portuguese meals are very abundant. Only the breakfast is a simple meal of coffee with milk, rolls, butter and Portuguese jam —compota de fruita, or in slab form—both very good.

On the Beach

The beach faces west, and the afternoon sun pours on to it and into the long row of beach tents which line the sands. These comprise each a cube of about 5½ ft. with sides of linen mounted on a wooden frame. The front portion facing the sea is normally raised on two forward poles to form an awning, but it can be let down for privacy or shade. The tents provide a convenient arrangement for retiring partially or completely from the hot sun while enjoying the warm air and light. Even in the morning mist there is enough diffused light to initiate the process of suntanning, and usually it is possible to spend the whole afternoon and evening pleasantly in the hot and, later, warm sunshine.

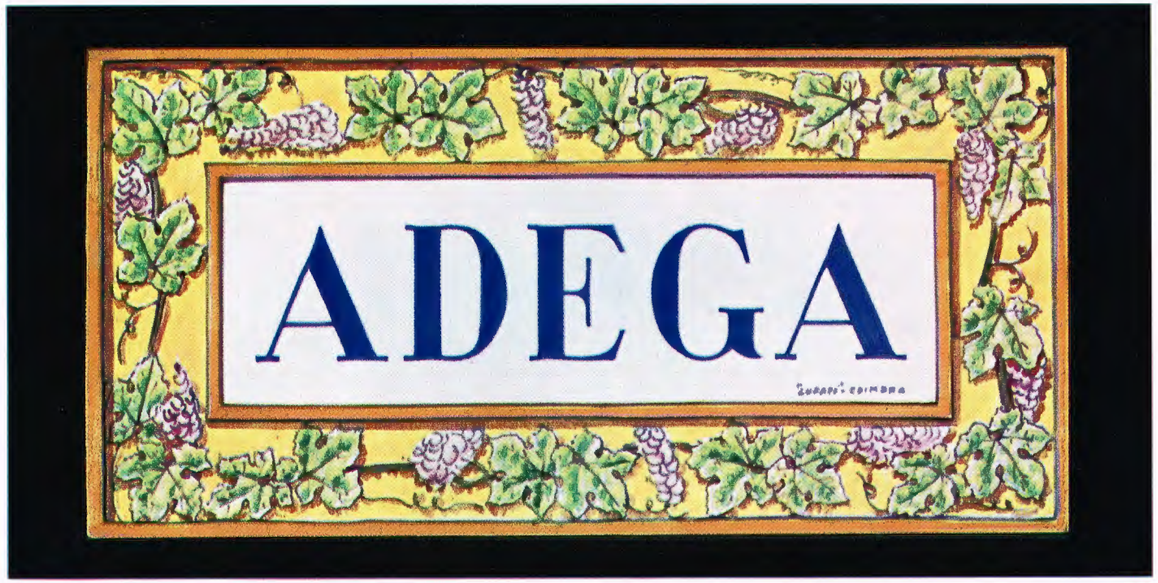
The variations of temperature and climate with longish periods of sunshine suit the northern anatomy and physiology better than continuous bright sunshine. The sea itself feels cold, but it is exhilarating and temperate enough for one to stay in for longish periods.

Every now and again a girl comes along the beach carrying a box containing trays of cakes which the Portuguese like so much. These girls, dressed in spotless white contrasting with their dark bare legs and handsome Moorish faces, create a pleasant hygienic picture which tempts one to buy their wares.

Another novelty is a man with a red cylindrical container with a rotating pointer on top which the customer spins at 1½d. a time. The pointer finally stops at a number and the man produces an equivalent number of cones, rather like ice cream cones, but empty, made from a wrapped leaf of fine biscuit. My wife had a go at this contraption and got 5 cones once and 25 at another try. Lemonade and various odd items, including lottery tickets, are also sold.

At the seaside was a display of country hand-made articles, such as linen embroidered table mats, rugs, lacework and the like, which one could buy at moderate prices.

The girls are in bright attractive bathing costumes, low at the back and high at the front. There are no midriff exhibits, so don't take your Bikinis, ladies!



The beach displays every racial type and colour—black, dark, red and blonde. Portuguese are Latins, whatever that may mean; but Portugal was a Moorish country for hundreds of years, and it was invaded by the Normans as well. While we were there it was invaded in force by the French. They were everywhere, and this itself is a testimony to the quality of the food and to value received. There was a large camping ground in the woods just at the entrance to the village, very gay and well conducted, and here again French cars and caravans were in force.

In the Forest

San Pedro is at the edge of the largest forest in Portugal and we made many interesting excursions into it, chiefly by following the numerous firebreaks and paths used by the foresters and the workers who collect the resin from the pine trees which form the bulk of the forest. The method of obtaining the resin consists in cutting a vertical strip of bark, about 5–6 in. wide, off the tree and inserting a thin open V shaped sliver of tinned iron to form a draining gutter. A "plant pot" (but with no hole) is fixed by means of a nail beneath the gutter, and the thick white liquid resin drips into the pot, where it coagulates. The first cuts are made at the base of the tree, and we counted as many as seven, each with its own pot, round the circumference. Later cuts were higher up the trees and there were not more than one or two. The resin from the pots is packed into large wooden casks to be transported from the forest. It was interesting to see this ancient "art" of producing polymeric chemicals, one of those arts which are being displaced progressively by synthetic chemical processes in factories.

There is a coast road from San Pedro running north to a lighthouse (Farol), and from there a circuit by road can be made to San Pedro, passing through a wood of magnificent blue gums which are grown in profusion in Portugal. These attractive natives of Australia are members of the eucalyptus family, and if the blue leaves of the new foliage are crushed there is a fragrant release of eucalyptus. The Portuguese make a piquant sauce from these leaves.

By making a small diversion a visit can be paid to a fire tower on a 300 ft. high wooded eminence. We climbed this tower by its outside spiral stair and had a magnificent view of sea and forest. The tower is manned by firewatchers. There was one at the top when we were there and his relief was in a small cottage at the foot. The men spend their spare time woodcarving. Each had a collection of items for sale in front of the cottage. There were wooden spoons, including large ones for jam making, small bowls and ashtrays. We bought a variety because they were attractive, as country-made "arts and crafts" usually are, provided they have not been specially designed for tourists. Purchasing these items from two men who had no word of English or French, and one of whom conducted his negotiations from the top of the 90 ft. tower, was quite an experience. We would have liked to learn what wood the implements were made from, but the nearest we could get was that it was from a tree whose fruit was redder than blood. Your guess as to what wood it is is as good as mine.

At the roadsides in the forest there are frequent notices É PROIBIDO CACAR—Hunting (shooting) prohibited. I don't know what there is to shoot, for we saw nothing, and mercifully there were few of the insect pests which proliferate in so many woods and sands. Indeed, neither my wife nor I got a bite which caused any swelling worth speaking of. There were a few small lizards camouflaged to their surroundings which occasionally darted across the paths, and a peculiar insect, like a small locust, which normally gave great leaps, grasshopper fashion, but also flew short distances, unfurling bright blue wings, which were most unexpected in a mud-coloured insect.

There are many interesting and historic places to visit not very far from San Pedro, but we had no car with us. There is a local bus which goes to the nearest village, Marinha Grande, about six miles away, but travelling by bus is very different from having one's own transport. However, if one wants a holiday at the sea, plus walking in the woods, a car isn't necessary.

Percy Thrower

Gardeners' Guide

With the lengthening days we look forward to and hope for the warmer weather which will be such a blessing after so prolonged and severe a winter. It is generally said that severe frosts, such as we have had, destroy many of the harmful insects. It would be nice if we could count on this, but greenfly and other forms of aphis, as well as other garden pests, are hardy little fellows, and we can be sure of them showing up again with the better weather. The wise gardener will be busy with preventive measures before they increase too rapidly. This also applies for mildew and other fungus diseases. Greenfly will soon begin to show themselves on the roses, and this is where 'Abol X' comes to our aid. We need only spray roses once a month or even less to be sure of having clean, healthy roses. I find it best to mix up the 'Abol X' with water according to the instructions and add 'Tulisan' to make it into a combined spray which will help to control mildew and black spot as well.

Having pruned and fed the roses last month with 'Plus,' the all-purpose fertilizer, we can, if we keep them clean, be sure of a good summer display. To make sure of continuity of flower we should feed the roses again next month to help the new shoots, which will provide the later flowers, to form. I find 'Solufeed' dissolved in water is the easiest and best way of feeding at this time of year, and the beneficial results can be seen in a very short space of time. Lawn mowings spread on the soil between the roses will help to prevent loss of moisture from the soil and make the feeding with 'Solufeed' even more efficient.

This is the season of the year too when black fly makes its appearance on the broad beans and from these spreads to the runner beans. I found last year that one spraying with 'Abol X' on the first sign of black fly kept the broad beans free for the rest of the season, and only one spray on the runner beans was sufficient too. After one spraying in the early stages the lettuces too were free from aphis. This is a big saving in time and labour – a very important factor to the present-day gardener.

The first sign of aphis on the fruit trees usually begins to show itself on the wall-trained trees, which are more sheltered than those growing in the open. They show even earlier on the peaches and nectarines in the greenhouse, and unless we spray early in the attack the young shoots and leaves are quickly crippled and distorted. As peach leaf blister is a common disease in most parts of the country on peaches and nectarines, as well as the ornamental flowering almonds, a combined spray of 'Abol X' and 'Tulisan' is best for this, and spraying must begin early in the season. If there are leaves on the peaches and nectarines already affected with the pinkish-white blisters these should be picked off and burned, and spraying should prevent further serious attacks of the fungus. In the greenhouse, greenfly on the fuchsias – which they seem particularly to like – and on the other plants are more easily controlled by using the Plant Protection pellets for fumigating than by spraying. Fumigating once a month from now on should keep the plants free from greenfly and other insect pests. The time to fumigate is in the evening as the sun is going down. To be sure of a good temperature, close the ventilators and door just before teatime. The warmth of the sun will be conserved, and the pellets can be placed on an upturned flower pot and lit as the daylight is fading. In the morning the doors and ventilators can be opened again.

Since the frost and the snow the lawn has taken on a rich green colour again, and we must aim to keep it this way. In May we must be sure to rid the lawn of any weeds, and we now have the new 'Verdone' which will kill more weeds than any other present form of selective weedkiller. To get the maximum results and to obtain a good kill of the clover in the lawn, feed it with 'Plus' all-purpose fertilizer late in April (two ounces per square yard) and spray with 'Verdone' about the middle of May. Do not mow the lawn for four or five days before or after spraying. Another such treatment in August or early September will ensure a weed-free lawn.

In the vegetable garden there is a scarcity of vegetables. The spring cabbages have not survived the severe weather too well, and the purple sprouting broccoli have suffered rather badly. The first fresh spring vegetables will be more than welcome, and the rows of seedlings are ready for thinning. Onions, if sown very thinly, should need no thinning, but parsnips will need thinning to nine inches apart. Lettuces also need thinning, and if the young plants are carefully lifted with a fork or trowel they can be transplanted. Succession should be the order of the day in the vegetable garden, and the lettuces transplanted will be ten to fourteen days later in forming their hearts than those left undisturbed in the rows. The first early potatoes need a little soil pulled up over the tops. This will help to prevent damage from late frosts. In April we must plant more potatoes, plant onion sets, sow more lettuce, radish and pea seed, and the first beetroot and carrot seed. On a border at the side of the main plot, seed of cabbage Savoy, cabbage January King, autumn broccoli, and purple sprouting broccoli can be sown.

In May it will be time for sowing both French and runner beans, marrows and more peas, lettuce and other crops to keep up a succession. The very valuable Brussels sprouts should be ready for planting too, and these, to give their best, need at least three feet from plant to plant and three feet between the rows. Club root control should be used when planting these and all other members of the brassica family if club root has been noticed in the garden in previous years. I think perhaps it is as well to use it as a preventive in any case.

At this time of year slugs enjoy the young seedlings and plants and of course feed at night. 'Slug End' tablets placed here and there between the rows and round the plants will help to reduce their numbers and should be used in all parts of the garden.

A Garland for a Crown

David H. Lessels

I don't know when I first got the idea of climbing Kilimanjaro. I think it came when I heard the mountain described as "the Crown of Africa." At least I know that when I boarded the trooper at Mombasa after two years' military service in Kenya I was obsessed with the idea of returning one day to climb it.

Four years later, after hitch-hiking over land and sea from Scotland to Tanganyika, I stood at the foot of Kilimanjaro, the highest mountain in Africa, and considered the task that lay ahead of me. As I gazed on my objective I didn't feel happy about my prospects of climbing it. A cloud enveloped the snow-capped peak and I knew that an icy blizzard would be blowing up there. At that time of the year the storm would be almost perpetual.

But above all other difficulties to be overcome if I were to reach the summit were the high-altitude effects which would be experienced near the top. Once over 13,000 ft., the rarity of oxygen is apt to cause a temporary reduction of will-power and initiative and lower one's resistance against headaches, fever, frostbite, and many other maladies that are rampant at that height. With the Kaiser Wilhelm Spitz, the highest point, at 19,565 ft., that leaves a long way to go in these conditions. I had heard tales of people who on attempting the climb had temporarily lost their minds, and it is not always the physically strong who are least affected—it is said women are less upset by the altitude than men. It is a question of acclimatisation. If one were able to remain at each successive level for a few days before proceeding to the next one, the effects would be considerably reduced and in many cases eliminated. But each additional day, because of the extra food and wages of the guide and porters, would push up the cost of the safari, and since I was travelling on a shoestring basis those extra days were luxuries out of my reach.

There are also the grimmer stories of the people who have died in Kilimanjaro's snow. These tales go far back in history. One legend has the air of the "King Solomon's Mines" mystery to it. In Abyssinia it is said that the Menelik, the son of the Queen of Sheba and King Solomon, died while climbing the mountain on his way back to Ethopia from his father's mines at Sofala. He was buried with all his treasures in Kilimanjaro's snow. Even today the belief lingers in Abyssinia that one day a new King of Kings will sweep south and reconquer the long-lost Ethiopian empire, and that day will come when the Menelik's scarab ring is returned from its resting place on Kilimanjaro.

I found myself ill equipped for such an expedition. However, at the little hotel at the foot of the mountain where I hired my guide and porters I managed to acquire most of the essentials, including heavy clothing and a balaclava helmet. My guide and four porters were recruited from the Chagga tribe, which inhabits the lower slopes of the mountain. By law this is the least complement with which one is allowed to make an attempt on the mountain.

Kilimanjaro has two peaks, Mawenzi and Kibo. Mawenzi is much more rugged than its neighbour, its jagged outline standing out like a row of broken teeth against the sky. But Kibo is the higher of the two and is permanently snow-covered. So it was Kibo I must aim for if I were to sit on the Crown of Africa.

The first day's march was along shady paths in the forest. A stream of ice-cold water from the mountain gurgled at our feet. A little white waterfall bounced into a black pool. Further on the forest grew into dense jungle. The branches overhead were knitted into an almost solid ceiling. Here creepers dangled and elephants roamed. We didn't see any of the latter, but their presence was evident in the trail of broken branches and half-chewed twigs that lay along the track.

There are three huts built on Kilimanjaro, situated at approximately 9000, 12,000 and 16,000 ft. We reached Bismarck hut, the first, without much difficulty. Torrential rain fell all through the night and late into the morning. We hung on until there was a break in the storm before setting out on the next pitch. When the rain stopped, the steam rose from the ground and permeated the forest like a laundry.

Shortly after leaving the Bismarck hut we broke through the forest and entered more open country. The rain started again, and all the way up to Peter's hut visibility was reduced to a few yards. I was amazed at the toughness of the porters. They carried the 50 lb. chop boxes on their heads with ease, while I staggered along behind carrying only a light pack of personal kit. About an hour away from Peter's hut we left the vegetation level. Before we did so the porters added huge bundles of firewood to their enormous packs. All fuel had to be carried now.

The porters, although born on the mountain, also suffer from the effect of the altitude. When a boy wants to become a guide he often has to have several attempts before he becomes acclimatised to the conditions and reaches the top.

Peter's hut is made of corrugated iron. Inside it is lined with plywood, mellowed with age and brown with smoke. Names, with dates as far back as 1920, are still discernible. In each hut there is a book in which climbers sign their names and add some remarks. At Bismarck hut the remarks had been effervescent: "Kibo, here we come!"; "It's a piece of cake!"; "Leaving now, the Whitsun special for Kaiser Wilhelm Spitz, calling at Peter's hut, Kibo hut and Gillman's Point"; and one that smacked of my own countrymen—"It's a dawdle!" Here at Peter's hut the names were fewer and remarks more sober.

I found it hard to sleep at that altitude although I was tired. The boys had difficulty in making a fire and food took a long

Snow on the equator: a distant view of Kibo Peak, Mt. Kilimanjaro

time to cook. The air was getting thin. Next day we climbed on to the "Saddle," the neck or ridge that connects Kibo and Mawensi. Once on top, we swung left and headed for Kibo.

On the Saddle it is flat. Although the sun shone, a biting, icy wind blew. It was unusual to have to combat the two extremes in climatic conditions at the same time. My old army bush hat, which I had always found sufficient protection against sunstroke on the veld, was hardly enough up here because the rare atmosphere made the sun's rays twice as dangerous. I lined my hat with several layers of brown paper for added protection, not knowing if this would prove effective or not but feeling at least it was a thicker insulation between my head and the sun. At the same time I applied a thick layer of vaseline to my face to prevent frostbite.

By this time I was really feeling the effects of the altitude. My head ached, and I had difficulty in curbing a desire to sit down and rest every few yards.

Towards afternoon snow began to fall. The wind increased in force until we were bent almost double into a piercing blizzard. About 5 p.m. we arrived at Kibo Hut. Once inside, with the stove lit, the world seemed a bit more friendly. I felt sluggish, and although I had lost my appetite I forced myself to eat the food the cook prepared. Outside the wind howled and fairly danced with temper, and in spasms worked itself into screaming tantrums in its endeavour to lift the roof off the hut.

The dwindled amount of names in the book here told their own tale of thwarted enthusiasm. Apprehension had crept into the remarks. "Hope we make it"; "Not feeling so good now, but determined to last as long as possible"; "Why do we do this?"

Next day was zero day. I was wakened at 3 a.m. and had an attack of mountain sickness immediately on rising, but took the porridge and tea the cook made although I didn't feel hungry. Also I hadn't got used to sleeping at that altitude yet, so I wasn't feeling very frisky. This was the day for the final assault on Kibo. Only Kimitani, the guide, accompanied me now. We set out dressed like men in the Arctic, Kimitani carrying a hurricane lamp. He had even donned boots for this last lap.

Yesterday's storm had blown itself out. But a hard frost put a razor edge on the slight breeze that blew. Crisp moonlight added to the intensity of the cold. Four a.m. at 17,000 ft. is no joke, even though almost on the equator.

As the time dragged on I fully realised that as a first-timer to Kilimanjaro I was fighting the full effect of the lack of oxygen. My head was splitting, and I was forced to sit down and rest at very short intervals. I forced myself to breathe through my nose, although my chest was burning and shouting for more air; breathing the icy air through my mouth might have had lasting repercussions.

While resting I was struck by the beauty of the moonlit landscape. It seemed almost unreal. A thousand feet below, a sea of cloud looked solid enough to walk on. Through this sea Mawenzi had stuck its rugged head. The snow lying in its deep crevices and gullies reflected the blue moonlight so that it glowed with a faint luminosity like a fairy island in a Hans Andersen world.

But soon a thin, misty veil crept across the moon and the swinging lantern in Kimitani's hand became an eerie glow in a nightmare world. The icy wind cut through the layer of vaseline

and made my face stiff and immobile. When I spoke to the guide my speech was inarticulate. Perspiration froze on the outside of my balaclava and formed a crust that crackled as I moved. I stumbled along after Kimitani, slipping on the ice and levering myself over huge boulders with my long spiked alpenstock, all the time trying to keep within the circle of lantern light. Kimitani, veteran of many climbs and long since acclimatised to the high altitude, climbed with effortless ease.

Just before 6 a.m. a red flame split the firmament along the horizon and Mawenzi dug its broken teeth into the sky and bit out its silhouette. Kibo's snow-capped peak was a raspberry-flavoured ice cream cone. About this time we reached the caves, half-way mark in this last pitch and starting point of the scree. This is a stretch of almost 2000 ft. of volcanic ash, stretching up to nearly the top of the mountain. The most exhausting part of the whole climb, it is encountered when the altitude effects are at their highest and resistance is at its lowest. This is where most spirits break and dreams of conquest fade.

After a brief rest at the caves we attacked the scree. With each step our boots sank ankle deep into the rubble before finding a solid base to take the strain. With heartbreaking slowness I edged my way up, slowly putting one foot in front of the other, and all the time trying to make each movement a smooth motion, for now my head banged like a gong, and I was forced to sit down and rest every few paces. The air was so thin that even breathing was a heavy task.

Gradually the caves receded into the haze and the top came into view and grew so clear I felt I could run towards it in a few minutes. But one must allow for the rare atmosphere when judging distances on high mountains.

"How much further, Kimitani?", I asked.

"*Mbili na nusu sa, Bwana,*" he answered in Kiswahili.

Two and a half hours yet—surely he was wrong? The top seemed so near, and also I couldn't endure the climb for that length of time more.

I tried to keep my mind off my troubles. I thought of places I had been to, of people I had met, of the various countries I had passed through on my travels, of books I had read—anything to keep my mind off that great bell I had for a head.

I can hardly remember pulling myself up the last rock on to the rim of the crater—a legacy of Kilimanjaro's volcanic youth—at Gillman's Point. Kimitani had been wrong, of course, when he said two and a half hours—it had taken three!

There followed the sweet satisfaction of signing my name in the book that is kept in a tin box up there—funny how the pen kept slipping from my fingers when I tried to write. The names here were a select few, the remarks graphic in their brevity.

"Sheer hell!" I wrote. After a rest, when I recovered my composure, we set off round the crater rim and climbed the Kaiser Wilhelm Spitz, the true top of Kilimanjaro and highest point in Africa.

Kilimanjaro is an extinct volcano. Inside the crater the crust is wrinkled and rugged. In the centre is the "Ash Can," the actual hole of the volcano, around which lie large sulphur deposits. Perhaps it isn't so extinct! It had taken nine hours from Kibo hut to the top; the journey back was done in three. The next day when we were once again down to the vegetation level the boys wove a garland of everlasting flowers for my hat. This is the prize they give for reaching the top. How proud I felt when, at the end of the five-day safari, I walked into the hotel wearing my crown!

ABOVE: *Mist and mountain. The Chagga porters struggling upwards above the vegetation level.* BELOW: *The road through the forest up to the Bismark hut, first stage in climbing Kilimanjaro*

Photograph by J. Allen Cash

Wallpaper on an embossing
machine at Withins'
Roach Vale Mill